

# 3·2·1·Contact<sup>®</sup>

## Swing into Sports and Health

- What Makes a Baseball Curve
- Check Out Your Health I.Q.
- Double Dutch Athletes
- Special ENTER Computer Section





# Got a Match?

Only two of these butterflies are exactly the same. Can you find them? If you can't, the answer is below.



Answer: Second row, last one. Fourth row, second one.



# 3·2·1·Contact

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Applied for membership, Audit Bureau  
of Circulations.

3-2-1 Contact (ISSN 0195-4105) is a publication of the Children's Television Workshop, published ten times during the year, monthly except for February and August. © 1986 Children's Television Workshop. All rights reserved. All contents owned by the Children's Television Workshop and may not be reprinted without permission. 3-2-1 Contact is a trademark and a service mark of the Children's Television Workshop. Printed in the U.S.A. Number 66, May 1986. Editorial offices: One Lincoln Plaza, New York, N.Y. 10023. Application to mail at second-class postage rates is pending at New York City and additional mailing offices. Send subscription orders to 3-2-1 Contact, P.O. Box 2933, Boulder, CO 80322. POSTMASTER: Send address changes to: 3-2-1 Contact, P.O. Box 2933, Boulder, CO 80322 (including label from cover of magazine). Subscriptions: 1 year U.S.A. \$11.95; Canada and other countries add \$6. Bulk copy rates to schools and other institutions available on request.



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ILLUSTRATION BY JENNIFER SKOPP

## Unearthly Vacation

The next best thing to outer space may soon be a theme park in California!

Visitors to Pacific Spaceport—set to open in 1988—will “lift off” for a simulated space shuttle ride to the “space station.” Once in “orbit,” visitors will tour the station, or travel to the moon.

What else is in store? Moon buggy rides will carry visitors across the lunar landscape. There will be a zoo filled with “alien life forms.” (Actually, they’ll be robots and costumed actors.) And, of course, there will be a place to take a nice, relaxing walk—space walk, that is!

## Clean Machine

It’s six o’clock—dinnertime. You can’t wait to dig in. But hold on! You’d better wash up first!

That pre-dinner habit may soon change forever. A Phoenix, AZ company now makes automatic handwashers. They’re about the size of a small TV, and

built to sit on a countertop. Slip your hands inside and a warm, pleasant burst of water blasts them clean and germ-free—in only eight seconds.

Scientific Growth, Inc. invented the machine for busy doctors and nurses who need lots of quick, thorough wash-ups.

But don’t throw the soap out yet. At \$1,700 a machine, it may be a while before every home gets a handwasher.

## Moo It Yourself

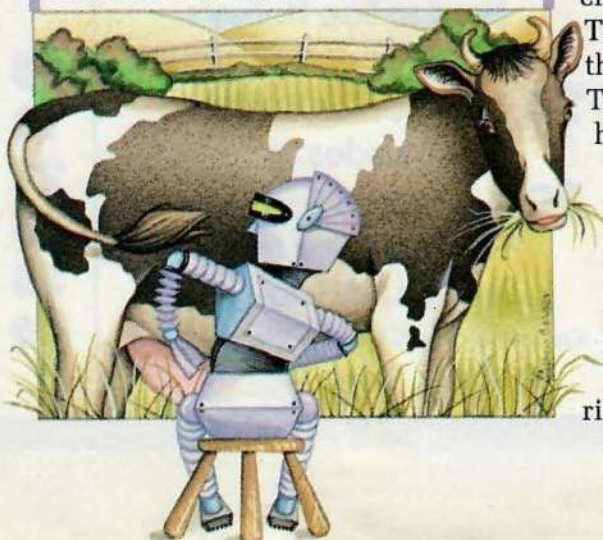
Dairy farms are going high-tech!

Computers can already keep track of how much milk each cow produces, how much it eats and how much it weighs. Now engineers in West Germany have developed a robot arm that does the delicate job of hooking up a cow to a milking machine.

What does the future hold? A robotic milking station. As each cow wanders up, the station would recognize it, decide whether it needs to be milked, and do the job.

With a robot’s help, a cow could just about milk herself.

ILLUSTRATION BY STEPHEN BERGER



## Freezer Fresh Water

People in Greenport, New York are actually drinking water from the sea.

The secret is ice. All winter long, pumps in Greenport spray seawater into a plastic-lined pool. Each drop of water freezes into an ice crystal.

The way water molecules line up in the crystals, there’s no room for extra chemicals like salt. So the ice is salt-free. The squeezed-out salt washes down a drain at the bottom of the pool. Spring comes and the salt-free ice melts into fresh water.

The freeze method works so well that its inventors plan to try it with other undrinkable water—water polluted with radioactive waste or chemicals.

## Ring Around the Volcano

Mount St. Helens, the volcano in Washington state, erupted six years ago this month. There have been lots of mini-eruptions ever since. Will the volcano explode again soon? Ask a tree!

“What’s that?” you say. Well, as ash pours from an erupting volcano onto nearby trees, it changes the way each tree grows. That changes the size or color of the ring the tree adds that year. The tree rings actually record the history of the volcano.

Dave Yamaguchi, a University of Washington scientist, says that unusual rings in nearby trees show that Mount St. Helens once erupted twice in three years (in 1480 and 1482). Yamaguchi is comparing tree ring patterns from those years



to patterns from the 1980's. History may not repeat itself, but if the patterns are the same, Mount St. Helens might be set for another blowout.

## Whales, Sound Off!

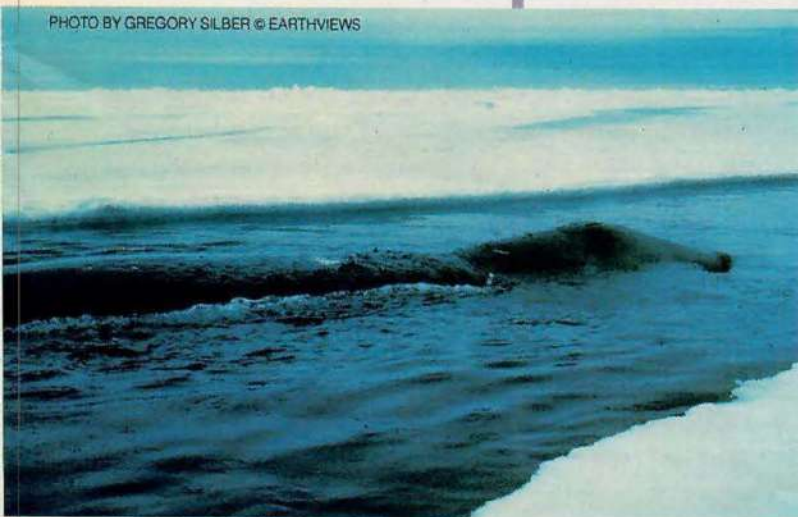
Scientists in Alaska have found a way to count what they can't see.

Bowhead whales—a disappearing species of whale—swim through the icy waters north of Alaska every May. But it's tough for people to stand out in the cold and count whales—especially since they swim beneath blocks of floating ice. So bowhead counters now use underwater microphones to record the whales' calls.

It's trickier than it sounds. Some whales make more noise than others. A computer compares several recordings to get a good count.

The listening method has recorded hundreds more bowheads than whale watchers ever saw. That's an earful of good news!

PHOTO BY GREGORY SILBER © EARTHVIEWS



Is it a long, skinny island? A big, black sub? No, it's a tough-to-see bowhead whale in the icy Arctic waters.

ILLUSTRATION BY BOB DELBOY



## The Phone's Outback

Australia's "outback" is a wild and rugged place—a land of gorges, gold mines, huge deserts and few people.

But there's plenty of sunshine, and that's what Australia's using to help outback residents keep in touch with the rest of the country.

Solar-powered phone booths—40,000 of them—have been sprinkled across the outback. Radio transmitters connect the booths to the rest of Australia's phone system. So feel free to call a kangaroo—or dial a drover (that's Australian for "cowboy").

ILLUSTRATION BY MARTIN LEMELMAN



## Think, Team, Think!

You've heard of college football, basketball, and maybe even baseball. Now there are college computer games!

Teams from eight Massachusetts colleges went head-to-head recently at Boston's Museum of Science for a 20-hour-long "Marathon of the Mind." The players munched on pizzas and donuts all night long while they struggled with a new fantasy game.

The winners? A team from Wellesley College. And you can guess what they won—more computer games!

## So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories that have to do with the future. (Be sure to tell us where you heard the story.) Send to: **3-2-1 Contact**

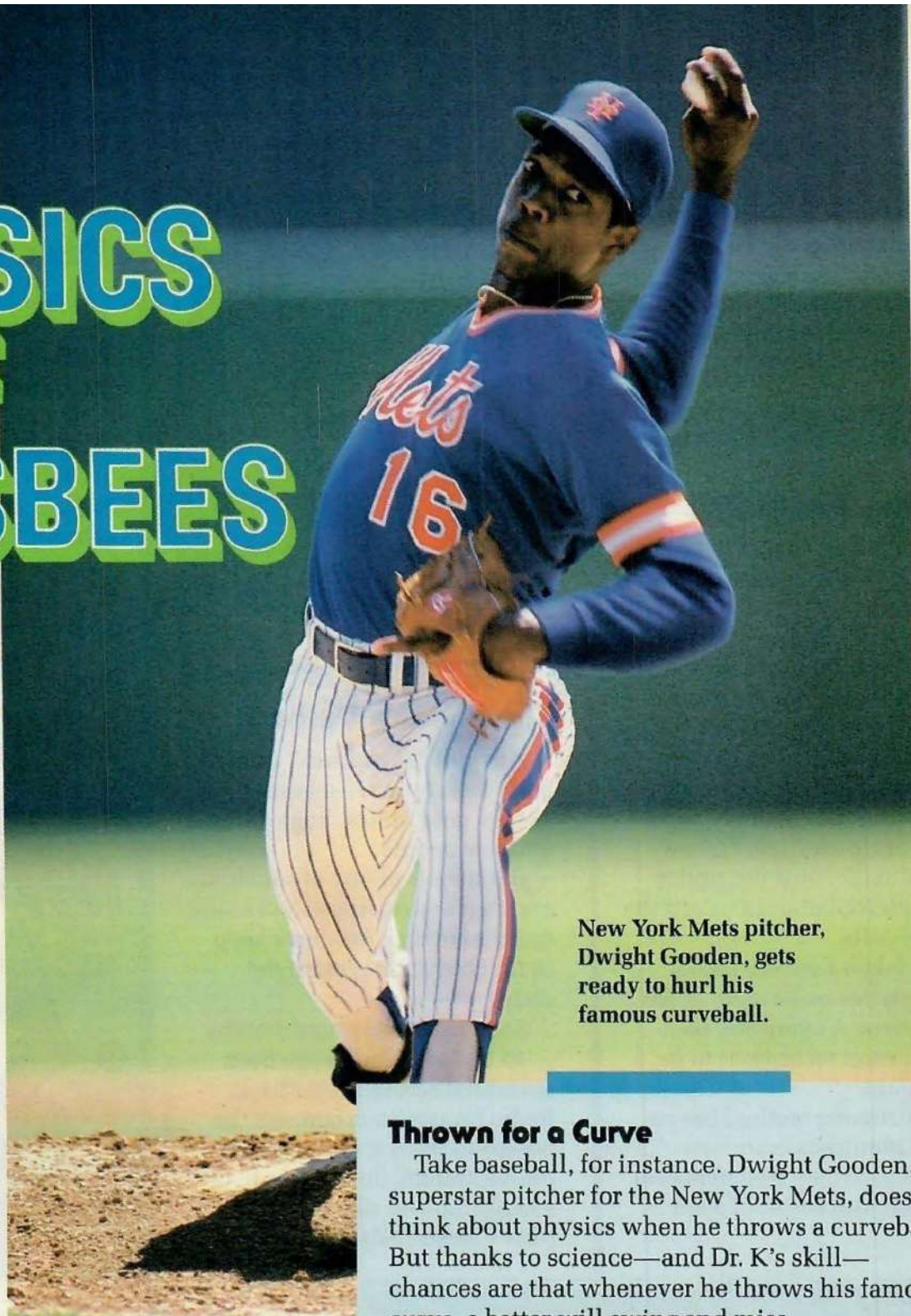
**1 Lincoln Plaza  
New York, NY 10023**



# THE PHYSICS OF FRISBEEES

## AND OTHER SPORTS SCIENCE

by Marc Berman



New York Mets pitcher, Dwight Gooden, gets ready to hurl his famous curveball.

PHOTO BY CHUCK SOLOMON/FOCUS ON SPORTS

What do you have in common with Olympic swimmer Steve Lundquist, baseball player Dwight Gooden, and gymnast Mary Lou Retton? Without even thinking about it, you all use science whenever you play a sport.

From throwing a curveball to throwing a Frisbee, from staying afloat in the water to doing a mid-air double somersault, sports are science. But for us, playing games is so matter-of-fact and so much fun that people don't usually think about the science at work when they play sports.

### Thrown for a Curve

Take baseball, for instance. Dwight Gooden, superstar pitcher for the New York Mets, doesn't think about physics when he throws a curveball. But thanks to science—and Dr. K's skill—chances are that whenever he throws his famous curve, a batter will swing and miss.

Why does a curveball curve? It's all in the stitching of the baseball—and the science of physics. "If the ball is thrown with a powerful spin, the rough surface caused by the stitching of the ball makes the air on one side speed up. The air on the other side slows down. This creates a difference in air pressure that pushes the ball to the left or right," scientist Jearl Walker of Cleveland State University told CONTACT.

The same law of physics affects a pitcher's "sinker" (when the ball suddenly dips), or "riser" (when the ball suddenly rises). Either way, the batter is always surprised. He swings and usually misses—strike one!



## Fact or Friction?

You dip into science every time you go for a dip in the water. You may have noticed that many male swimmers seem to have hairless bodies and very short haircuts. No, it's not that swimmers have to be naturally hairless to be champions. Most male swimmers shave their body hair and their heads before a big meet. And most female swimmers wear bathing caps. It all has to do with friction.

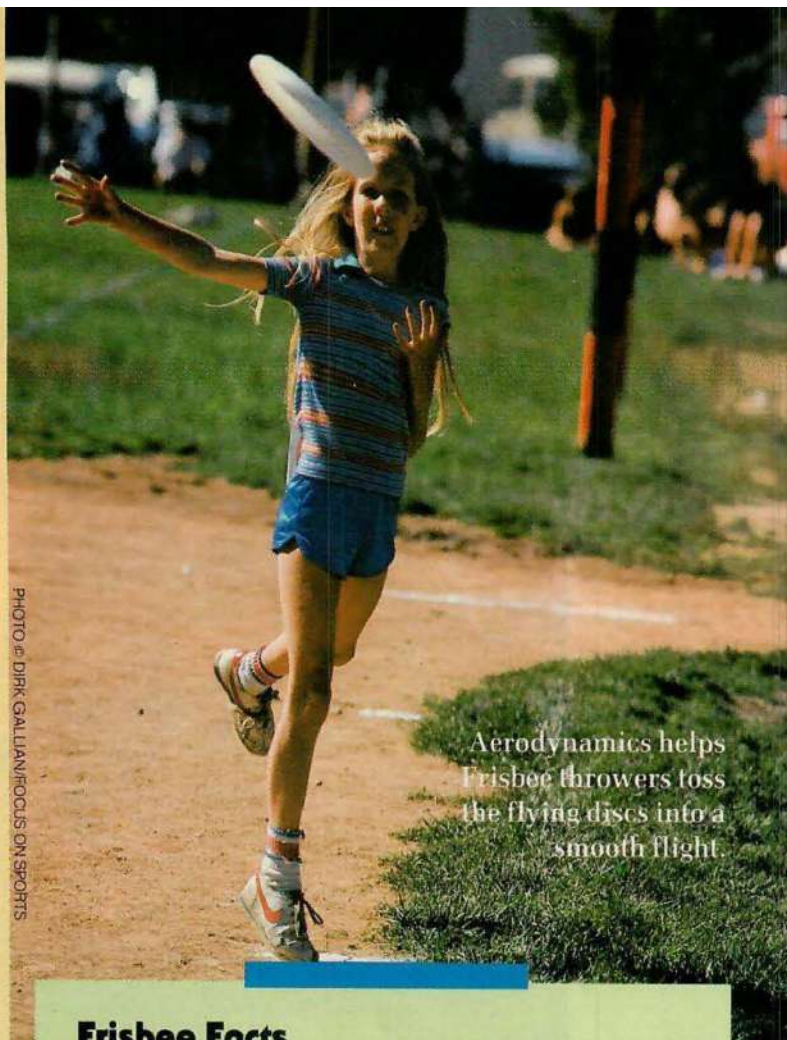
When you squeeze the hand brake on your bike, the brake rubs against the moving wheel and slows it down. That's friction. Swimmers believe their hair slows them down the same way—by causing friction with the water. No one is sure this is true, but lots of swimmers shave anyway. That way, they feel they're putting every bit of effort they can into winning.

One swimming coach says there's another reason to shave. He's Dave Reeves, a trainer at the Sports Training Institute in New York City. "Shaving takes off the outer layer of dead skin cells and leaves the nerve endings more exposed. So when you hit the water, your reflexes may be better," he told CONTACT.

Of course, you don't have to have your nerve endings exposed to enjoy the water. Water sports for some people just means lazily floating on a lake on a hot summer day.

There are a couple of reasons why people float. The air in your lungs helps you float. So does the fat in your muscles. Fat is made of oils, and oil floats on water. In fact, fat people stay afloat more easily than thin people. Super-skinny people with lean, dense muscles and small lungs may be sinkers.

PHOTO © DIRK GALLIAN/FOCUS ON SPORTS



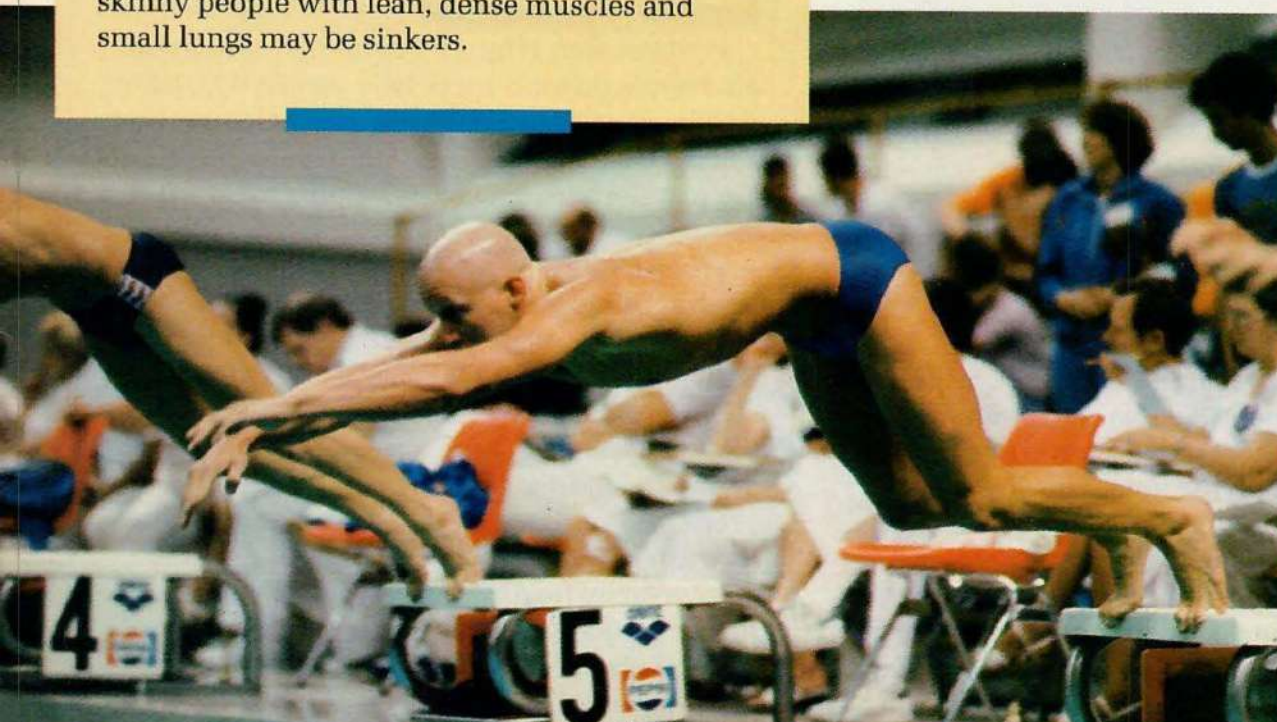
Aerodynamics helps Frisbee throwers toss the flying discs into a smooth flight.

## Frisbee Facts

You've probably thrown a Frisbee—the popular flying disc that cuts through air easily and silently. If you have, you've benefitted from a lot of research in aerodynamics. That's the study of how air flows and how air currents affect objects that fly.

Dan Raddick, who works for WHAM-O, ➡

PHOTO: FOCUS ON SPORTS



Most male swimmers shave their heads and body hair to cut down on friction.



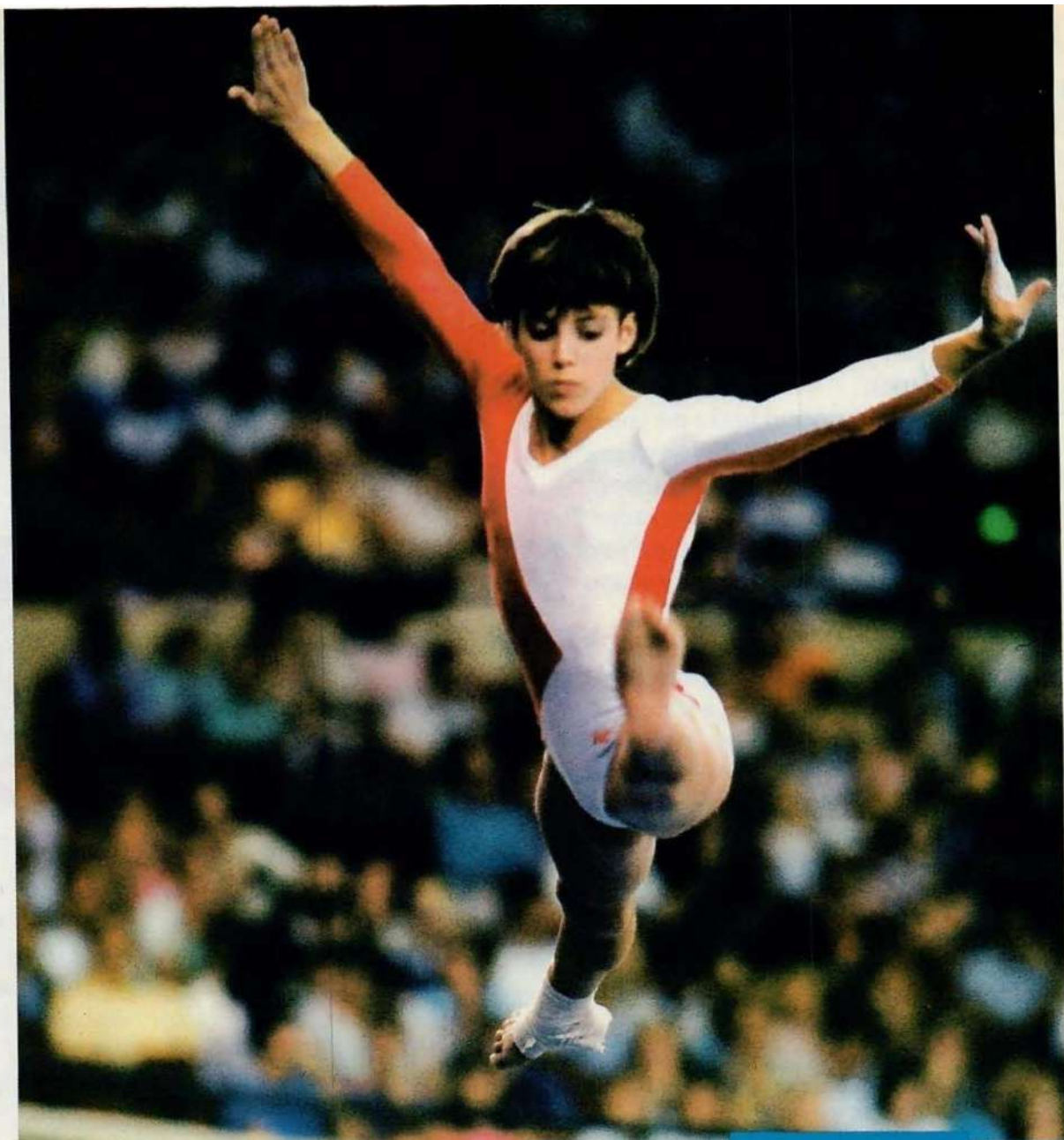


PHOTO: FOCUS ON SPORTS

Gymnasts use science to thrill fans with fantastic flying feats.

the company that makes Frisbees, says the Frisbee's designers had two aerodynamic goals: the smoothest flight into the wind and the longest possible flying time. The design that resulted has the edges turned under, like the front of an airplane wing.

The shape helps the Frisbee cut through the air and keeps the disc aloft. Spinning keeps the Frisbee from wobbling, just as a top doesn't wobble as it spins around.

### Jumpin' Gymnastics!

Frisbees aren't the only items that spin in the air. People do too—especially people who take part in gymnastics. When Olympic champs Kurt Thomas and Mary Lou Retton strut their stuff on the parallel bars, science is helping them whirl and twirl.

When gymnasts fly off the bars for a fancy landing, they use the same physics you've seen in ice skating. As they spin, they pull in their arms and legs to spin faster. Then when they are about to land, they extend their arms and legs so that they spin less. In that way, they are ready for a smooth landing.

So the next time you're whirling and twirling, throwing a curveball, perfecting your Frisbee toss, or lazily floating on the water, you can thank science for letting you have so much fun!

For some sports tips from a sports superstar, turn to page 30. ◀20▶





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fashion stripes...**

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Girl!**



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# Play Ball!



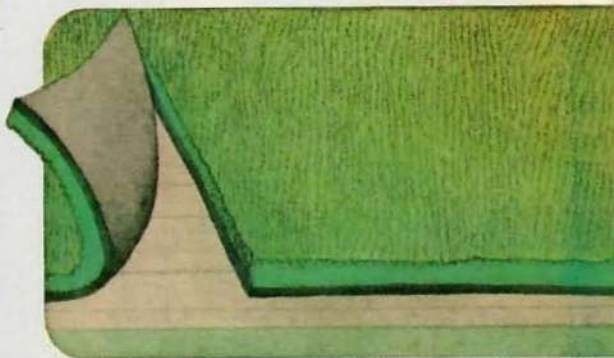
## How big is a batter's bat?

That depends on how big and strong the batter is. The rules say that a bat can be no more than 42 inches (1.1 m) long. But most players stick to one about 35 inches long. That's several inches longer than the average little league bat.

Pro bats are made from ash and hickory trees. Hickory is a little heavier than ash. But both of these woods are just the right strength and weight for pounding baseballs.

## Is this real grass?

That depends on where the game is being played. In the ball parks of nearly half the major league teams, they don't mow the grass. They vacuum it! In these stadiums, the grass fields have been replaced with green carpets that look like grass. Why use fake grass? It's cheap and easy to care for. The first artificial grass field was in the Houston Astrodome. That field is covered with strips of green carpet 15 feet wide. These strips were first glued to pieces of foam. Then they were put down on the field. Finally, they were zipped together. It took three miles of heavy-duty zippers to do the job.



## What is a rosin bag for?

Near the pitcher's mound is a small sack, called a rosin (RAH-zin) bag. What's in it? Rosin, of course!

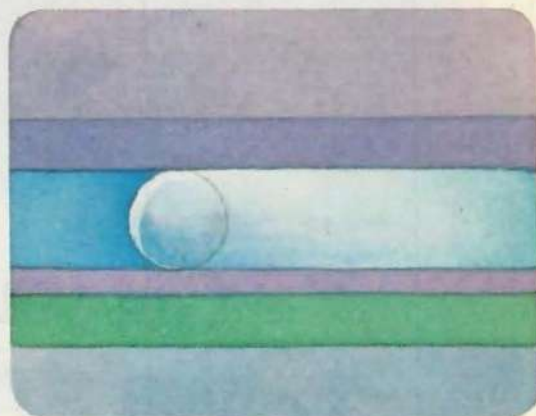
Rosin is a dry sticky substance. It comes from pine trees and has many different uses. These include making paint, cement and soaps. Pitchers use a bag filled with rosin powder to keep their hands dry. This helps them get a good grip on the ball.

Pine trees produce another substance that is used in baseball. Have you ever noticed that some players' bats are black near the end where they hold them? This means they rubbed the handle with pine tar. This sticky stuff helps a hitter get a hold on the bat. That means he can swing more powerfully.



## How fast does a baseball travel?

A pitcher's fastest pitch is his fastball. Most fastballs travel at about 90 miles per hour. One of the fastest fastballs belongs to Nolan Ryan of the Houston Astros. It travels at a sizzling 101 miles per hour. At that speed, a ball takes less than half a second to reach the batter at home plate. No wonder a good fastball is so hard to hit! A special machine called a radar gun is used to measure just how fast a pitcher throws a baseball. Instead of shooting bullets, this gun shoots invisible microwaves. These waves hit the baseball as it travels towards home plate. The waves bounce back to the gun. By measuring how fast the waves return, the machine can tell how fast the ball is traveling.



## How does a pitcher throw a curveball?

To throw a curve, a pitcher holds the ball between his thumb and next two fingers. When he brings his arm forward to throw, he lets go of the ball with a sharp twist of the wrist. The ball starts spinning. It's the spin that makes the ball curve.

All baseballs push their way through invisible particles of air. This causes friction and slows them down a bit. When a ball is spinning, the air presses against it unevenly. The ball is pushed slightly to the left or right. That's a curveball. Simple, right? Not if you're trying to hit it!







## What is a baseball made of?

If you could cut one open and peek inside you might be surprised at what you'd find.

After taking off the white leather cover, the first thing you would see is a dried layer of rubber cement. This glue holds the inside of the ball together. Underneath the glue is a ball of cotton and wool yarn. Each baseball has a quarter mile of yarn tightly wound round and round inside it. It might take a while, but if you unwind all that stuff, you'll come to the rubber part of the ball. It's really three thin rubber balls, one inside the other. First there is a black ball, then a red ball, then another black one. Underneath the rubber is the real center of the baseball. It's made of cork.

Each year, professional teams use nearly half a million baseballs. And each one is made the same way.

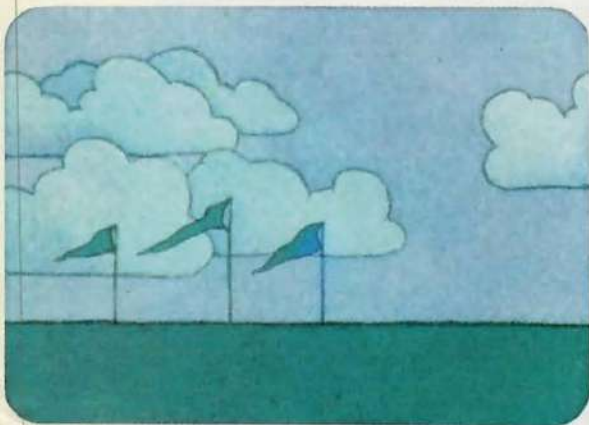
## Are all baseball gloves the same?

Not quite. Most fielders use the the same basic kind of glove.

If you have a glove, it's probably this kind, too. But a couple of baseball players use gloves that are made to suit their special jobs on the field.

A first baseman's glove should really be called a mitten. It has a space for the thumb and one for the rest of the fingers. Catching throws is a first baseman's most important job. So his glove is made to snap shut when a ball goes into it.

A catcher's glove has a place for each finger, as a regular fielder's glove does. But you could never guess from looking at it. The glove is covered with many more layers of thick padding. That makes it possible for a catcher to grab those 100-mile-an-hour fastballs without getting hurt.



## How does weather affect a baseball game?

You know that a heavy rainstorm will keep teams from playing baseball. But weather has a lot to do with baseball even on a bright sunny day. On a hot day, air particles are more spread out. A batted ball can fly more easily through this warm thin air. There are fewer air particles pressing against it, so there is less friction slowing it down.

Atlanta Stadium has some of the thinnest air of any big league park because it is located high above sea level, and the temperature is almost always hot. Home runs soar out of there so quickly that it has been nicknamed "The Launching Pad."

Of course there are other things that affect how far a ball will go. But it doesn't hurt to have some help from the weather.

## What team has the most spectacular scoreboard?

Some teams have scoreboards that shoot off fireworks. Other teams have a "matrix" board that writes black and white messages. And some teams use the snazziest, a video board called DiamondVision which flashes giant-size pictures in brilliant color. It's like watching a 33-foot-high color TV set. But only one ball park sports all three, and that's Comiskey Park in Chicago. So when a White Sox player hits a home run—watch out! Get set for exploding fireworks, a giant light show, animation, graphics and even a close-up of the guy running around the bases—all at the same time. Now that's what we call a home run!





# Factoids

Some eagle nests weigh as much as a ton.

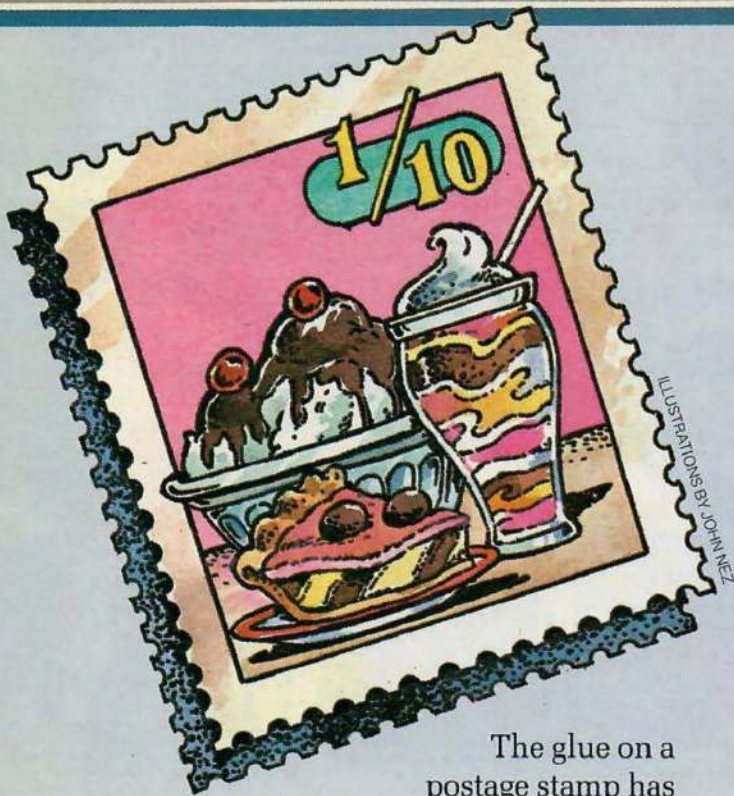


Arachibutyrophobia is the fear of peanut butter sticking to the roof of the mouth.

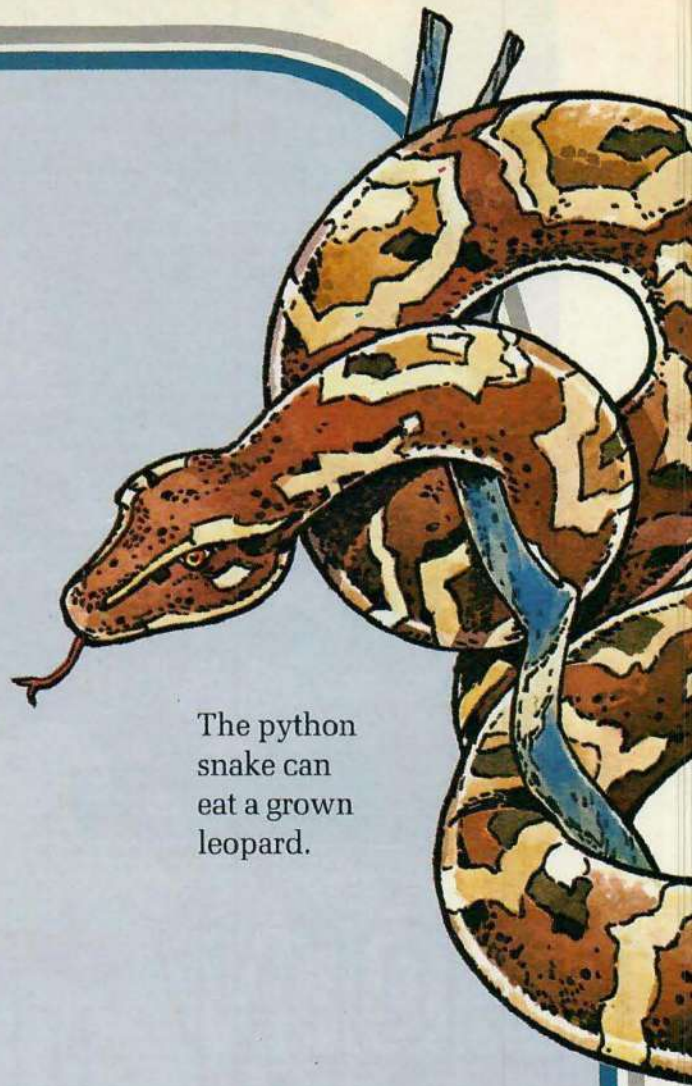
The average U.S. teen-ager eats 1,817 pounds of food a year.







The glue on a postage stamp has one-tenth of a calorie.



The python snake can eat a grown leopard.

The record for a kite flight is 169 hours.







# DOIN' THE DOUBLE

**"We're the Diamonettes,  
And you can make a bet,  
We're gonna win this game,  
And make it to fame!"**

That's what the Diamonettes double dutch team says at the end of every performance—and they mean it! Double dutch may look like a game of jump rope to some people, but to these sixth grade athletes, it's a serious sport.

"We practice three times a week, for two hours, and more before a tournament," 11-year-old Tiffany Bailey told CONTACT.

That's a lot of rope jumping. But the Diamonettes' hard work paid off, because they were one of the teams to make it to the Twelfth Annual Double Dutch World Invitational Championships. To top it off, the tournament was held in their hometown—Philadelphia.

## Two Ropes Are Better Than One

What is double dutch? It's jump rope with two ropes turning at the same time. The ropes turn inside each other, like the blades of an egg beater. That makes it hard just to jump up and down as the ropes turn. But jumpers like the





Diamonettes do a lot more. They do somersaults, dances and all kinds of acrobatic tricks.

No one knows for sure how double dutch got started. But it has been around for hundreds of years. It got its name when it was played by the children of Dutch settlers in New York City.

Nowadays, double dutch is a regular sport with leagues, tournaments and strict rules. And it's spreading to other countries like Australia, Japan and Germany.

## Flying Feet

One of the most exciting parts of a double dutch tournament is the speed test. The jumpers try to complete the most jumps in two minutes. The world record is 365 jumps—three jumps per second!

Victor Morris, 17, is a member of the Valley Park DD Force team from Valley Park, South Carolina. His personal record is 322 jumps in two minutes. How does he do it?

"I've been jumping since I was eight years

# DUTCH

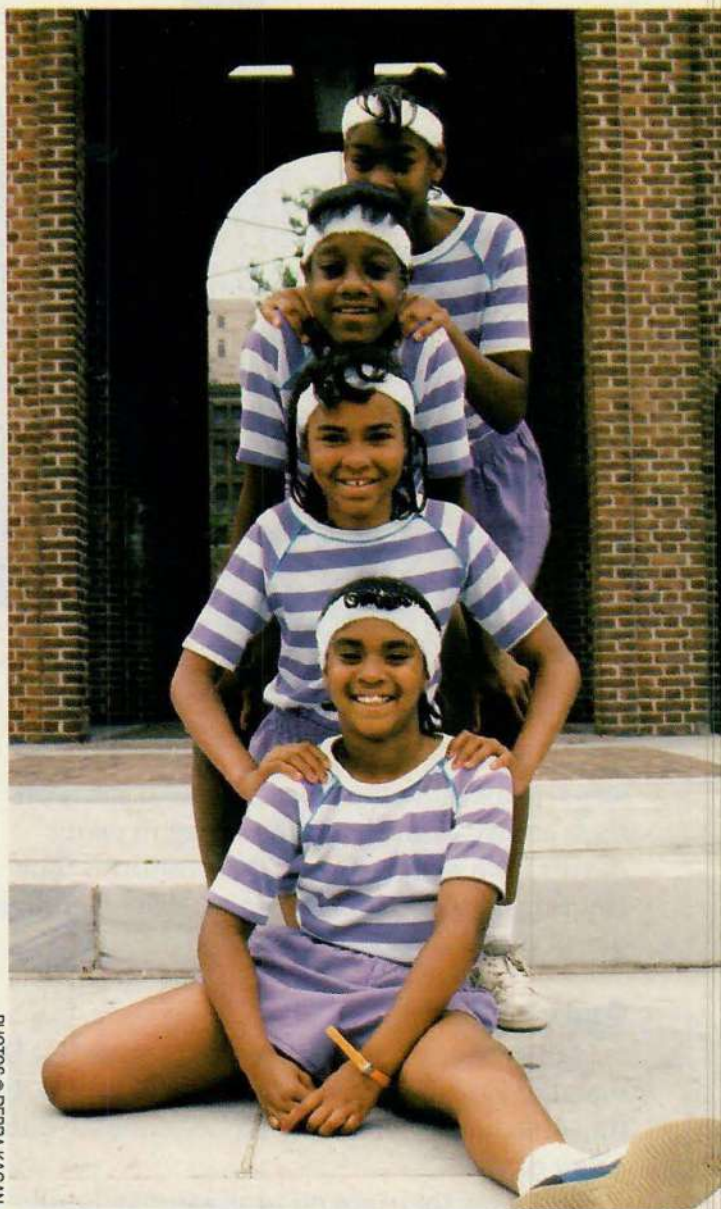
by  
Richard  
Chevat

old," Victor told CONTACT. "I just practice with my team, and I also play other sports at school, like basketball and football."

It's not surprising that double dutchers are good athletes. Lots of people jump rope just to get in shape.

"Double dutch is great for building up your heart and lungs," says the Diamonettes' coach, Derra Jones. "It also requires speed, agility and creativity."

The creativity comes in when the teams plan their freestyle program. That's the part of the competition when the jumpers use dance ➡



PHOTOS © DEBRA KAGAN

**Above:** Diamonettes Tiffany Bailey, Nicole Johnson, Shonda Brooks and Belinda Atkerson take a break from double dutching.

**Below:** Double dutch routines combine speed with many different gymnastic tricks like handstands, leaps and somersaults.







**Left:** Victor Morris in the speed test. The judges count each time his left foot touches the ground.

steps, leaps and other movements to show off their ability. Some teams have begun using moves from gymnastics in their routines. The Hot Dogs, a team from Kirkland, Washington, is one of these.

### Gymnastic Jumps

"I plan to go on to be a gymnast," says Hot Dog member Heather Nobriga. Heather is 10 and, like the other team members, practices double dutch every day.

Right now there are no professional double dutch teams. But some of the older jumpers, like

the McDonald's Daily News Dazzlers from Philadelphia, receive scholarship money for appearing around town. And double dutch organizers hope the sport will be an Olympic event.

Whatever happens, jumping rope isn't just kid stuff anymore. Jumpers are staying with the sport longer and longer. Some plan never to quit.

As Victor Morris, says, "I'm going to double dutch till I'm old and can't do it any more."

If you want to learn more about double dutch, or to start your own double dutch team write to: **The American Double Dutch League, PO Box 776, Bronx, New York 10451.** ☎20

**The Seattle Skips, from Kirkland, Washington, go through their freestyle routine.**



PHOTOS © DEBRA KAGAN



Exercise, dieting, eating right—it seems like everyone is into the health craze these days. Today, medicine and science promise to make us all healthy and fit. But are new ideas always the best? Here are some health ideas that have been around for a long time—some for 100 years or more! Which ones are true and which ones are just old fairy tales? See if you can separate the meat from the baloney in this quick CONTACT quiz. Then turn the page for the answers.



ILLUSTRATION BY JIM DEIGAN

by Megan Stine

1. Coffee stunts your growth. **True or False?**
2. Carrots are good for your eyes. **True or False?**
3. When you're sick with a cold or the flu, hot chicken soup will help. **True or False?**
4. People who have arthritis can sometimes predict the weather from the way their joints feel. **True or False?**
5. You shouldn't go swimming right after eating a big meal. **True or False?**
6. Drinking a glass of warm milk right before bedtime will help you sleep better. **True or False?**
7. If you eat yogurt every day of your life, you'll live to be 100 years old. **True or False?**
8. Walking barefoot will give you flat feet. **True or False?**

## A CONTACT QUIZ



## Quiz Answers



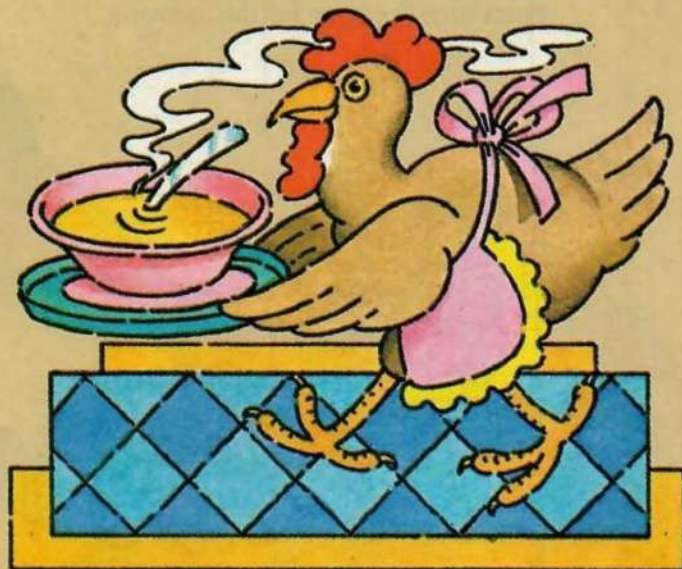
**1 False** No matter what your grandmother says, coffee doesn't stunt your growth. But this bit of folklore grew out of a simple fact that parents have instinctively known for years and years. The fact is: If you drink coffee every day instead of milk, you probably won't be getting as much protein as you need. And shortchanging yourself on protein will really stunt your growth.

Besides, many doctors believe that caffeine isn't very good for you. Since coffee, like tea, colas and other drinks, contains caffeine, it's probably smart not to drink too much of it.



**2 True.** Carrots contain a lot of carotene, which your body changes to vitamin A. The retina of your eye uses up a little vitamin A whenever it is working. So eating carrots helps supply the vitamin A your eyes need.

**3 True.** Chicken broth is a good source of two things you need a lot of when you're sick: liquids and salt. When you have a high fever or when you're throwing up a lot, or when your nose is running a marathon, you lose water from your body. That's why doctors always tell you to drink plenty of liquids! The more liquids you can push through your system, the better chance your body has of sending germs on their merry way. But if you lose too much water, you can get dehydrated. That's when salt comes in handy—it helps your body hold on to liquids.



**4 True.** Cold weather, or changes in the weather, can affect people with arthritis. So they may know in advance when it's going to rain. This is partly because their blood vessels and muscles contract (get smaller) and their pains get worse when the air gets cold. But your local radio station is a lot more reliable. Best of all, look up at the sky!

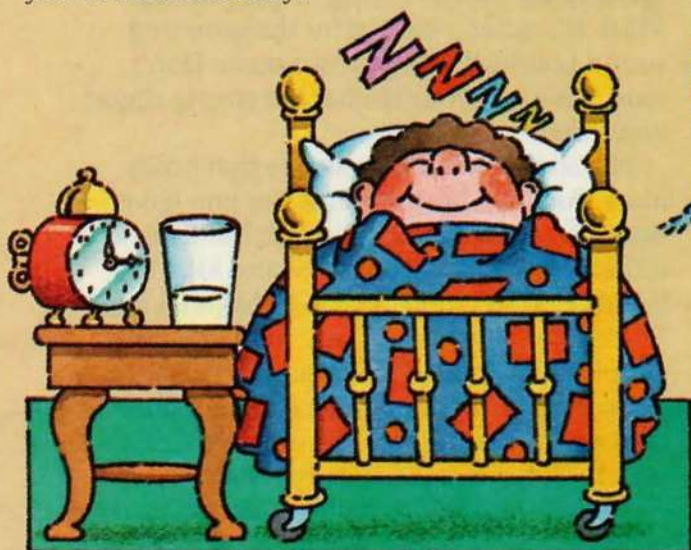


ILLUSTRATIONS BY JIM DEIGAN



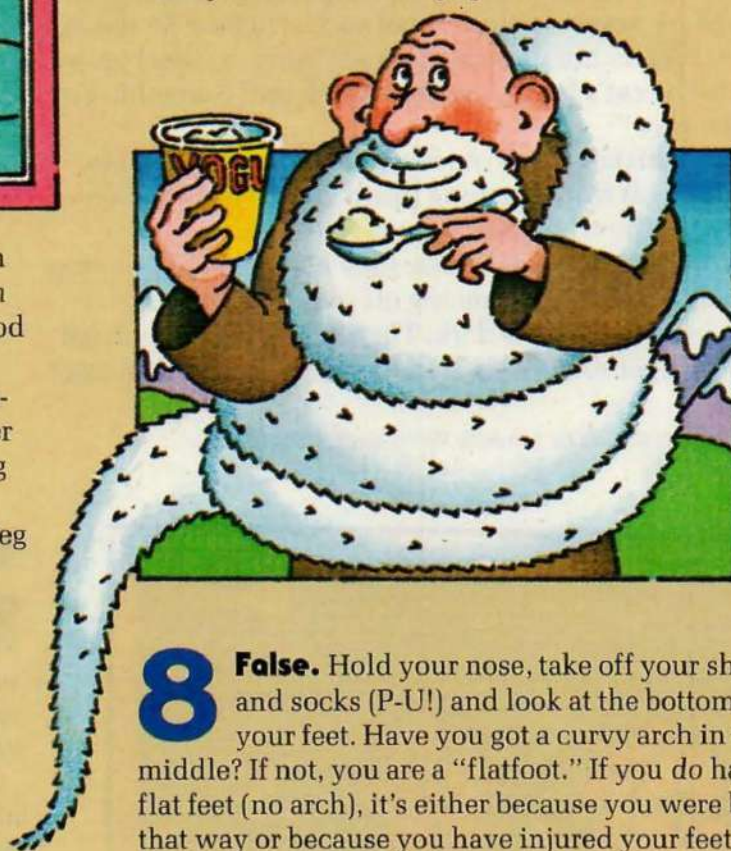


**5 True.** If you pig out on three burgers, then jump into a cold swimming pool, you can get stomach cramps. Exercise pumps blood into your muscles. That takes blood away from your stomach. That can interfere with your digestion and give you cramps. So, it's a good idea after eating a big meal to wait 30 minutes before taking the plunge. But you don't have to go overboard following this rule. Most swimming cramps are leg cramps. They have nothing to do with whether you've eaten recently.

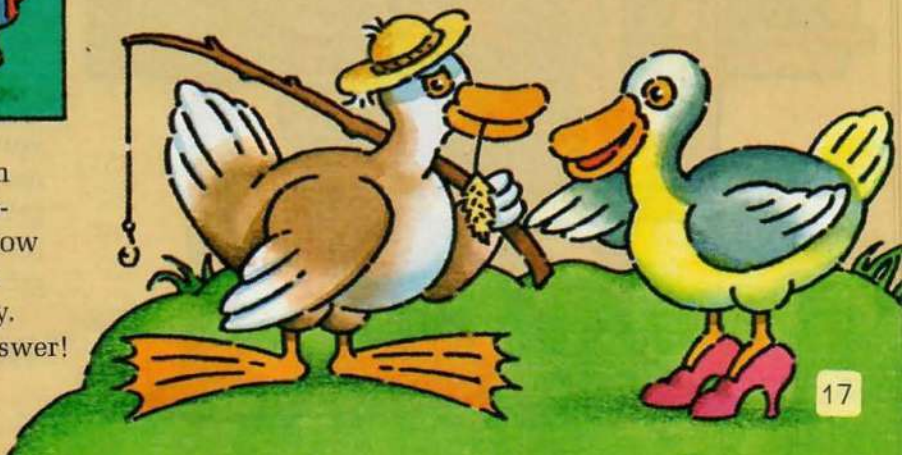


**6 True.** Scientists have learned that warm milk contains a substance called tryptophan (TRIP-toe-fan). They aren't sure how tryptophan works. But it seems to trigger some chemicals in your body which make you sleepy. Getting sleepy? Wake up and read the next answer!

**7 False.** Have you seen those bearded, gray-haired, 125-year-old men on the yogurt commercials on TV? The ads try to make you believe these people live so long because they eat yogurt every day. It's true that yogurt is a pretty nutritious food, especially plain yogurt. It has lots of protein and it's easier to digest than milk. And it's made with bacteria that some scientists think are good for your digestion. But no one has ever proved that people who live to be 100 or older have lived so long because they eat yogurt. Maybe it's the water they drink, the air they breathe, or any of a dozen other reasons. Of course, just because it won't help you live to be 100 doesn't mean you shouldn't eat yogurt.



**8 False.** Hold your nose, take off your shoes and socks (P-U!) and look at the bottom of your feet. Have you got a curvy arch in the middle? If not, you are a "flatfoot." If you do have flat feet (no arch), it's either because you were born that way or because you have injured your feet. Either way, walking barefoot will not give you flat feet. In fact, going barefoot in the grass or on the sand is very good exercise for your arches. But jumping without shoes can do your feet a lot of damage. So don't skydive barefoot!





# Any Questions?

by Renée Skelton

**Why do cats have whiskers?** Whiskers do look pretty funny sticking out of the side of your cat's face. And you might think they're kind of useless. But they do serve a purpose for your cat. They help keep her on her toes.

Whiskers are your cat's feelers. They help a cat get a handle on what's around her—especially in the dark. There are nerves at the base of each whisker. So when the whiskers brush up against anything, a signal goes out to the cat's brain, saying "Watch out! Something's in the way."

The whiskers stick out way beyond a cat's head to keep the cat from crashing into a wall. One touch on the tip of the whiskers might mean danger.

Whiskers are so sensitive, they pick up slight breezes—even vibrations bouncing off of solid objects. This is helpful in the dark. Through its whiskers, a cat can "feel" if something is in the way—even if she can't see it.

Question sent in by Lindsay Weissbach, Encino, CA.



## Why does your stomach growl?

You're sitting in class taking a test. It's quiet—except for the growling sound coming from your stomach. Don't worry. It's just your stomach trying to digest your food.

The stomach is a big muscle that holds more than just food. Even when you haven't eaten for awhile, your stomach has an acid in it that helps soften your food and kills the bacteria. Your stomach also holds enzymes. These chemicals help break food down so your body can use it. Last but not least, there is always air in your stomach. When there is no food in there, all that liquid and air swishing around can make strange noises.

A lot of times though, the noise isn't even coming from your tummy. It's coming from your intestines. The intestines are a long, narrow winding tube. The food and air can get pretty noisy passing from your stomach into this tiny passageway. So you hear those growling noises—and so does everyone else!

Question sent in by Stephanie Watwood, Jacksonville, FL.



Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

**Any Questions?**  
**3-2-1 CONTACT**  
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Ridgefield, NJ 07657

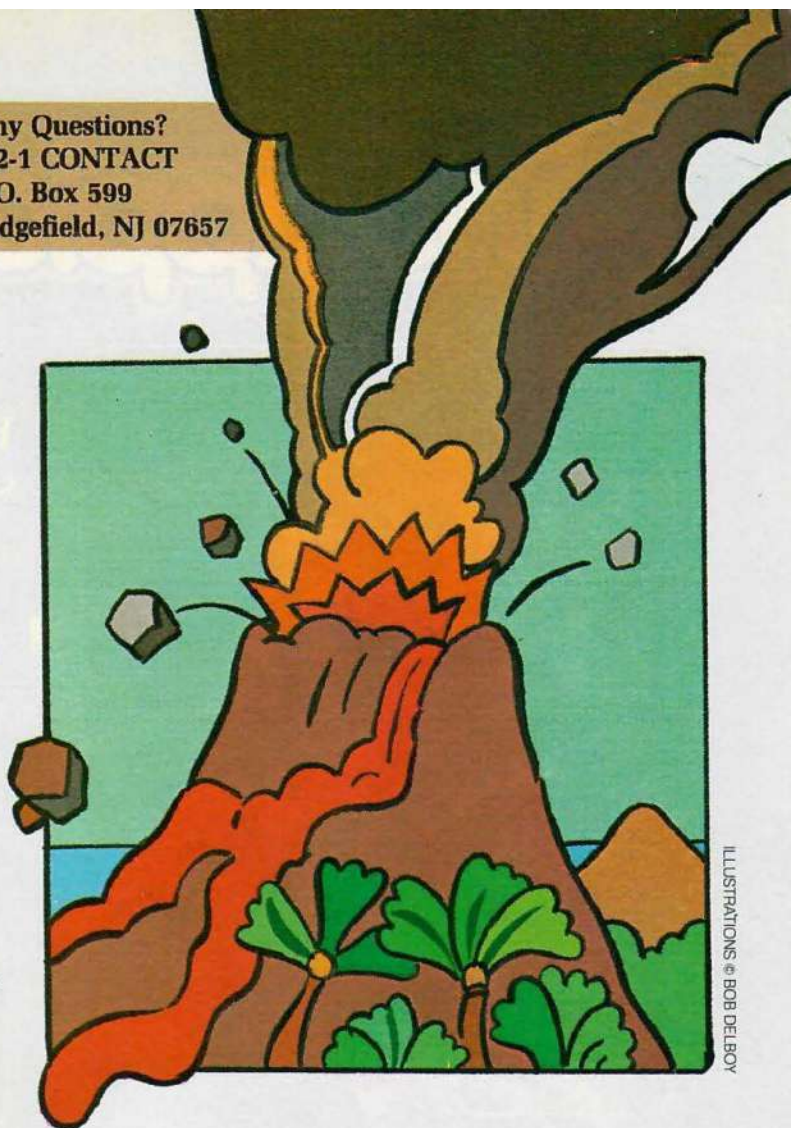
**How are rocks formed?** Rocks come in all different shapes and sizes. But they are formed in just three ways.

Some rocks are made from magma—a hot liquid that flows out of erupting volcanoes. Magma comes from deep within the Earth. When it reaches Earth's surface, it cools and hardens into rock. This kind of rock is called igneous (IG-nee-us).

The second kind of rock is softer than igneous. It's called sedimentary (sed-uh-MEN-tuh-ree). That's because it's made from sediment: tiny bits of soil and shells and skeletons of sea animals that lived in ancient lakes and oceans. Over millions of years, the layers of sediment got squished together and hardened into rock. Chalk is a sedimentary rock—made from the shells of tiny sea animals.

The third type of rock is metamorphic (met-uh-MORE-fik). This rock forms when other types of rock are heated and squeezed together deep in the Earth. Heat and pressure change it from one type of rock into another. Diamonds are a metamorphic rock.

Question sent in by Erica Pederson, Brandon, MS.



ILLUSTRATIONS © BOB DELBOY

**How do they make 3-D movies?** Making objects on a flat screen look three-dimensional is a neat trick. It's done by making each of your eyes see the same thing in a slightly different way.

Normal movies are shot with one movie camera. Three-D movies are shot with two cameras or one camera with two lenses. They are placed side by side, about as far apart as the distance between your eyes. So both cameras shoot the same picture, but from slightly different angles. That's just the way your eyes look at a scene.

In the movie theater, the film from both cameras is shown at the same time on the same screen. The trick is to get the picture from the left camera to your left eye and the picture from the right camera to your right eye. What makes it look 3-D is the special filters that are used. One set of filters is placed on the lenses of the two projectors showing the movie. The other set of filters is placed on the eyes of the people watching. That's right! Those are the weird glasses you have to wear at a 3-D movie.

Question sent in by Marc Quiam, Livingston, NJ.





# Pineapple

# Magic

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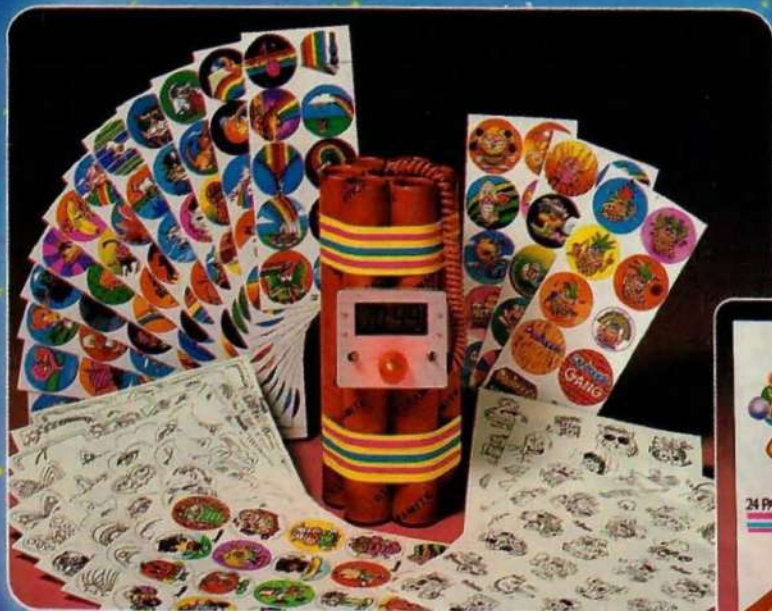


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# THE BLOODHOUND GANG

## The Case of the Sneaky Slugger

ILLUSTRATIONS BY BOB PEPPER

by Becky Cheston



**W**hy you're not listening, Vikki," said Skip, sounding annoyed. They were sitting in the Bloodhound Gang's office and Skip was trying to tell her about his little league team.

"Sorry, Skip," said Vikki. "I just don't like baseball that much."

"But this isn't just baseball," said Skip. "There's something very funny going on."

"The way you guys play, there's always something funny going on," said Ricardo as he came in.

"I'm serious," said Skip. "Some of us on the Eagles went down to watch the East Side Sluggers practice. We heard they had a new star player—Gary Jackson!"

Vikki looked up from her desk. "Gary Jackson!" she said. "He can't play baseball. He can't do anything except be nasty to everyone. How'd he get on the Sluggers?"

"I don't know. But I tell you one thing, somehow he's become a really terrific pitcher! And a good hitter too."

"Gary Jackson, an overnight baseball star?" said Ricardo. "You know, Skip, there is something funny going on."

"Maybe the Bloodhound Gang should investigate," said Vikki. "Let's head over to Fraser Field."

At Fraser Field, the Bloodhound Gang found

Dennis Carlisle, first baseman for the Eagles, sitting in the stands. He looked very sad.

### **A Diamond in The Rough**

"This is unreal," Dennis moaned.

"I'll say," Vikki agreed. Gary Jackson was on the mound, tossing pitches to his teammates. He was striking out everyone.

"No one ever saw Jackson even touch a baseball until a couple of weeks ago," Dennis said. "Now look at him."

Gary had stepped down from the mound to take his turn at batting practice. He was a big kid, kind of chunky looking, with dark, slicked back hair. He hunched over the plate, staring angrily at the new pitcher.

"Look, he doesn't even know how to hold a bat," said Dennis, with his head in his hands.

"He doesn't have to," said Ricardo, as Gary hit the ball over the fence.

"Is it my imagination," said Vikki, "or does he look different, too?"

"It's his hair," said Skip. "He used to wear a crew cut, now he wears it long and slicked back with a lot of grease."

"Never mind his haircut!" cried Dennis. "How are we going to win the big game on Saturday?"



## Follow The Bouncing Ball

On Saturday, Fraser Field was packed. The stands were filled with people waving banners, cheering and stomping their feet. But soon the Eagles' fans didn't have much to cheer about. At the end of three innings, the Sluggers were ahead 3-0. Gary Jackson had struck out six Eagles in a row.

Vikki and Ricardo watched from the bleachers. Skip came over to the fence to talk to them.

"Gary's pitches are impossible to hit," he said. "They do crazy things. They spin and hop all over the place."

"He really has some funny moves, doesn't he?" added Ricardo, pointing to the mound.

Before each pitch, Gary took off his cap, scratched his head, and ran his fingers through his greased-back hair. He touched his glove to his nose, pointed his elbows out and shuffled his feet back and forth.

"Hey Skip, time to take the field again!" Dennis Carlisle yelled.

"Don't give up, Skip," said Vikki. "We'll get to the bottom of this."

"Just try to do it before the bottom of the ninth, okay?" Skip said as he headed for center field.

The Sluggers were up again. Their first hitter got a single. Then Gary Jackson stepped up to the plate. He took his strange batting stance, then hit the first pitch over the right field fence! The Sluggers were leading 5-0, and it was only the fourth inning.

"Ricardo, did you notice something strange?" Vikki asked him. "Where was Gary just before he came up to bat?"

"I saw him go into the locker room for a minute," said Ricardo. "Hey look! He's going in there now!"

"Why would he go into the locker room before and after he bats?" asked Vikki.

"I don't know, but maybe we'd better find out," replied Ricardo.

Ricardo and Vikki slipped down to the locker room door. Vikki kept watch while Ricardo went inside. He came out a minute later.

"What did you find out?" asked Vikki as they took their seats again.

"Just that Gary Jackson is a slob. His locker is filled with grungy towels, old bars of soap, and a

couple of broken combs. I also found a large tube of hair cream. He's got an extra bat in there and these." Ricardo held out his hand and showed Vikki some bits and pieces of cork.

"I can't figure out why Jackson would have pieces of cork in his locker," he said.

"Mmmm," said Vikki, "Ricardo, we have to find out what he does in there before he bats. Is there a place in the locker room where you can hide and watch him?"

"Yeah, but there's only one problem."

"What's that?"

"I don't think I can stand the smell of Skip's locker."

By the seventh inning the Sluggers were still leading 5-0. As usual, just before Gary's turn to bat, he slipped into the locker room for a minute. But this time, Ricardo was hiding behind a row of lockers.

As Ricardo watched, Gary quickly placed the bat he was carrying in his locker and took out another that looked exactly like it. Then he returned to the field.

Ricardo followed a few seconds later, just in time to see Gary hit a double.

"Did you find out anything?" Vikki asked Ricardo when he returned to his seat.



"Yeah," said Ricardo. "Gary may have hit a double, but I think the Bloodhound Gang is about to score a home run."



## Switch Hitter

It was the top of the ninth inning. The Eagles had gotten two runs in the eighth so the score was 5-2. This was their last →



chance to stop the Sluggers from winning. Somehow, the first two Eagle batters got on base. Skip was up next. He stepped up to the plate.

"Hey Skip, wait a minute!" someone yelled.

It was Ricardo. Carrying a bat in one hand, he ran up to Skip. Ricardo and Skip changed bats.

"Quit stalling," sneered Gary Jackson from the mound. "Get ready to strike out!"

But the sneer was wiped off Gary's face when Skip connected with the first pitch and slammed it over the right field fence. It was a three run homer, tying up the score at five each. The Eagles' fans went wild!

But Skip didn't move from home plate.



ILLUSTRATION BY BOB PEPPER

"Run, Skip!" yelled Dennis Carlisle. "You have to touch all the bases!"

But Skip didn't move. A crowd quickly gathered around home plate as the Eagles poured off the bench and the Sluggers ran in from the field. Arguments started to break out.

"Quiet everyone!" shouted Ricardo, running up with Vikki. "This game is over—it's been sabotaged!"

"What are you talking about?" asked Dan Carson, the Sluggers' coach.

"We're talking about this," said Skip as he lifted the bat he had just used to hit the home run.

"Hey, that's my bat!" yelled Gary Jackson.

"Thanks for admitting it," said Skip. "Ricardo found this bat in Gary's locker. He used it every time he was up. Now look at this!"

Skip smashed Gary's bat against the ground. It splintered, and inside were lots of little holes stuffed with a tan spongy material.

"Cork," said Vikki. "It's an old trick. Drill open the bat, make a few holes and fill them with cork. Then glue the bat together again."

"With the cork inside, the bat is lighter, so you can swing it harder and faster," Skip explained. "Also, it gives the bat more spring. When the bat hits the ball, it absorbs energy. A springier bat returns more energy to the ball, making it go farther."

"So that explains his hitting," said Dennis Carlisle. "But what about his great pitching?"

## **A Foul Ball**

"Oh, that's a hair-raising story, right, Gary?" said Ricardo. He held up the tube of hair cream. "You know how he always runs his fingers through his hair before a pitch? Well, he puts some of that grease on the ball."

"A greaseball!" said Dennis.


"That's right," said Vikki. "Putting grease on one side of the ball makes its surface uneven. The air flows around the ball unevenly, which makes the ball spin in strange ways."

"That's why his pitches were so hard to hit," said Ricardo.

"Gary," said Coach Carson. "You just stopped being a Slugger."

"Thanks for going to bat for us," said Dennis Carlisle as Gary left the field in disgrace.

"It was easy," said Skip. "Gary Jackson was out of his league."

"Besides," said Vikki. "This case was a real ball." 

**Watch for next month's  
Bloodhound Gang  
mystery!**



ILLUSTRATION BY DAVE E. BLAND



# Letters

## Super Family Collection

Dear 3-2-1 CONTACT,

I'm writing about the "Amazing Stuff" article in the September 1985 issue. It's one thing to see what they collect in the Smithsonian museums, but another to have something from your family there!

My great-grandfather built the oldest, still-standing log and clay pottery shop in the U.S. The Smithsonian asked permission to put it in the museum. It's still in storage, but it's exciting to think that one day I will be able to go to the Smithsonian and see it. I can hardly wait.

Julie Kay Tillman  
Hampton, MA

Dear Julie,

Wow, Julie! It must be neat to have something from your family in a museum. We'll be on the lookout for it next time we're in Washington.

## Laura's Story

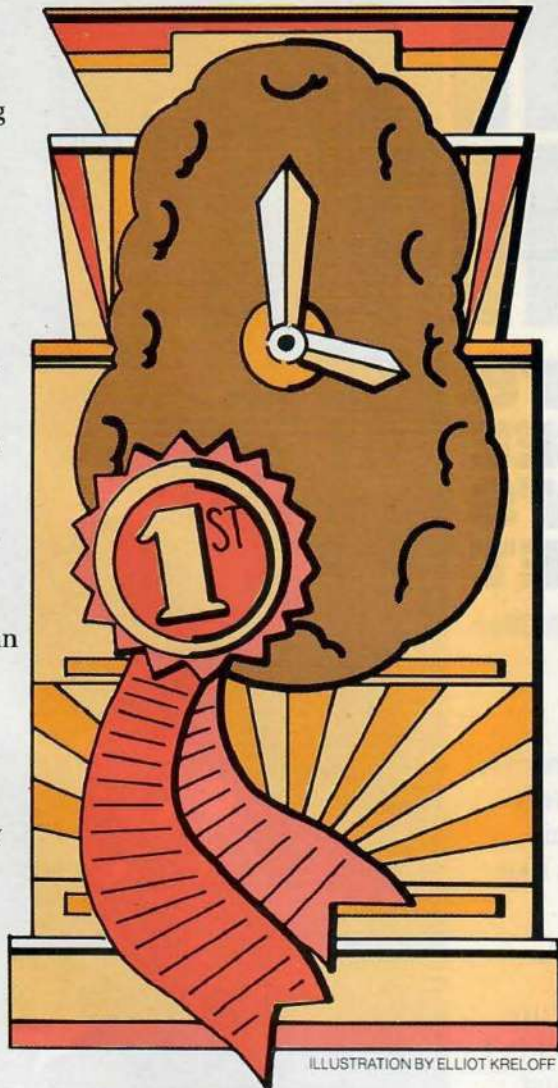
Dear 3-2-1 CONTACT,

I really liked "Laura's Story" (September, 1985). I'm handicapped too, and it's not often that I read a story about another handicapped person. I have a Sharp Communicator that I use in school. It helps me to do my work and to tell people what I want when they can't understand me.

Cindy Curtis  
Sun Valley, CA

Dear Cindy,

Thanks for letting us know that there are other kids out there using special computers. We're glad it's helping to make your life easier. And, of course, we're thrilled that you use it to write to CONTACT.



## Time A-peel

Dear 3-2-1 CONTACT,

You published an article about a clock that ran on potatoes (Coming Attractions, Sept. '84). I thought it was a clever idea. Later in the summer I was in a science fair. I entered Mr. Borst's idea. I ran a clock on potatoes and called it "POTATO POWER." I won a prize. I just want to thank you and Mr. Borst for an a-peeling idea that's a winner!!!

Amy Morris  
Trenton, MI

Dear Amy,

Congratulations on the great job. We think you're a winner too!

## California Blues

Dear 3-2-1 CONTACT,

I'm always upset after I enter contests, because it seems like people from California never win. I was wondering if you do this on purpose?

Ashley Traina  
Felton, CA

Dear Ashley,

The winners of our contests are picked because they're the best—not because of where they come from. But in case you Californians are still worried, in our contest where we gave away 16 computers, three of the winners were from California. That's more than any other state.

## Comet Watching

Dear 3-2-1 CONTACT,

I really liked your November issue on Halley's comet. It helped me a lot at school. My great-grandmother saw Halley's comet when she was 13. I hope to be just like her and see it a second time!

Suzie Koup  
Downington, PA

Dear Suzie,

We may not be around to see Halley's comet twice, but we sure hope all of you will!

## We Want Mail!

Dear Readers,

We really love hearing from you. The questions, ideas and complaints we get help us make CONTACT a better magazine. So why not drop us a line? We can't answer every letter, but we do read them all. Send your mail to:

3-2-1 CONTACT: Letters  
P.O. Box 599  
Ridgefield, NJ 07657



# NIGHT LIGHT

## WHY IT'S HARD TO SEE HALLEY'S COMET

by Russell Miller

Ever wonder what the United States looks like at midnight? Here's a satellite's-eye view. Compare it to a map of the U.S. and you'll have no trouble finding Florida, or cities like Chicago, Atlanta or Los Angeles. Maybe you can even find your hometown.

The satellite that took this picture from 450 miles above the Earth didn't need a giant-sized flashbulb. It just used the light that pours from American towns all night long. You could say you're looking at the world's biggest night light!

And that's one reason why Halley's comet is so hard to see. As this photo shows, few towns ever get really dark. It's hard for the comet to compete with the light from below.

This "light pollution" is old news to astronomers who need darkness to study stars with their telescopes. The brighter our night lights are on Earth, the harder it is for space scientists to see the rest of the universe. ☾

U.S. AIR FORCE PHOTO, COURTESY OF HANK BRANDLI









# The Muscles

by Rae Paige

Shhh! Don't move! See if you can be absolutely still for just one little minute. Shhh. Ten, nine, eight, seven, six, five, four, three, two, one . . . time's up. Did you do it? Not a chance! No matter what, your muscles are working. If you're breathing, your diaphragm—it's a muscle—is working to fill your lungs with air. If you're sitting, your back muscles are working to keep you from falling over. If you're reading this paragraph, muscles are making your eyes follow words. If you're alive at all, your heart is pumping constantly. GOTCHA!

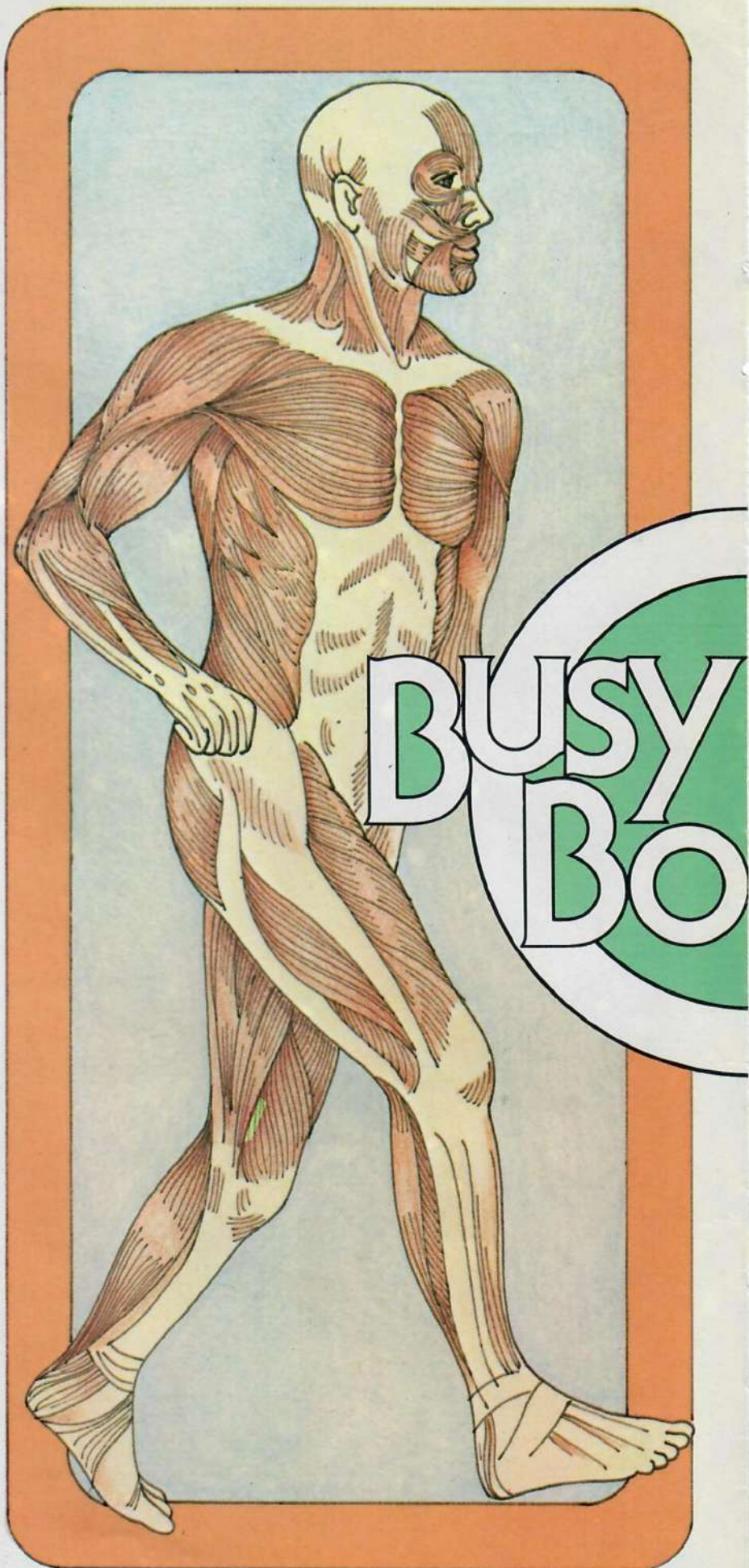
## Meet Your Muscles

Muscles perform many different jobs—everything from running to snoring, breathing to digesting, hiccupping to blinking an eye. Muscles also line the organs in your body—like the stomach, heart and lungs.

If you stripped away your skin and fat, you'd find muscle underneath. There are about 650 muscles in your body. They help give you shape. Muscles themselves come in many shapes and sizes. How big they are depends on the jobs they perform.

The muscles that make your eyes blink, for instance, are tiny and thin like thread. The muscles that make you frown or smile are flat and only an inch long. The muscles in your legs are big and long and bulging.

You can divide muscles into three basic kinds. What are they? Keep reading!





**Skeletal Muscles** These are the muscles attached to your bones. They are called *voluntary muscles*, because they do what you tell them. If you are thirsty right now, you can tell the muscles in your arm to put this magazine down, and the ones in your legs to take you into the kitchen.

Skeletal muscles are also called *striated* (stry-ate-ed) muscles, because they look as if they are arranged in rows of stripes.

Skeletal muscles don't always do what you tell them to. Sometimes they work automatically, in a *reflex action*.


**Smooth Muscles** These muscles are also called *involuntary muscles*, because you don't control them. These muscles are the ones that line the organs of your body.

They also make up the walls of your blood vessels. They are called smooth because—you guessed it—they look smooth instead of striped. These muscles don't respond as quickly or strongly as striped muscles do, but they also don't get tired as fast.

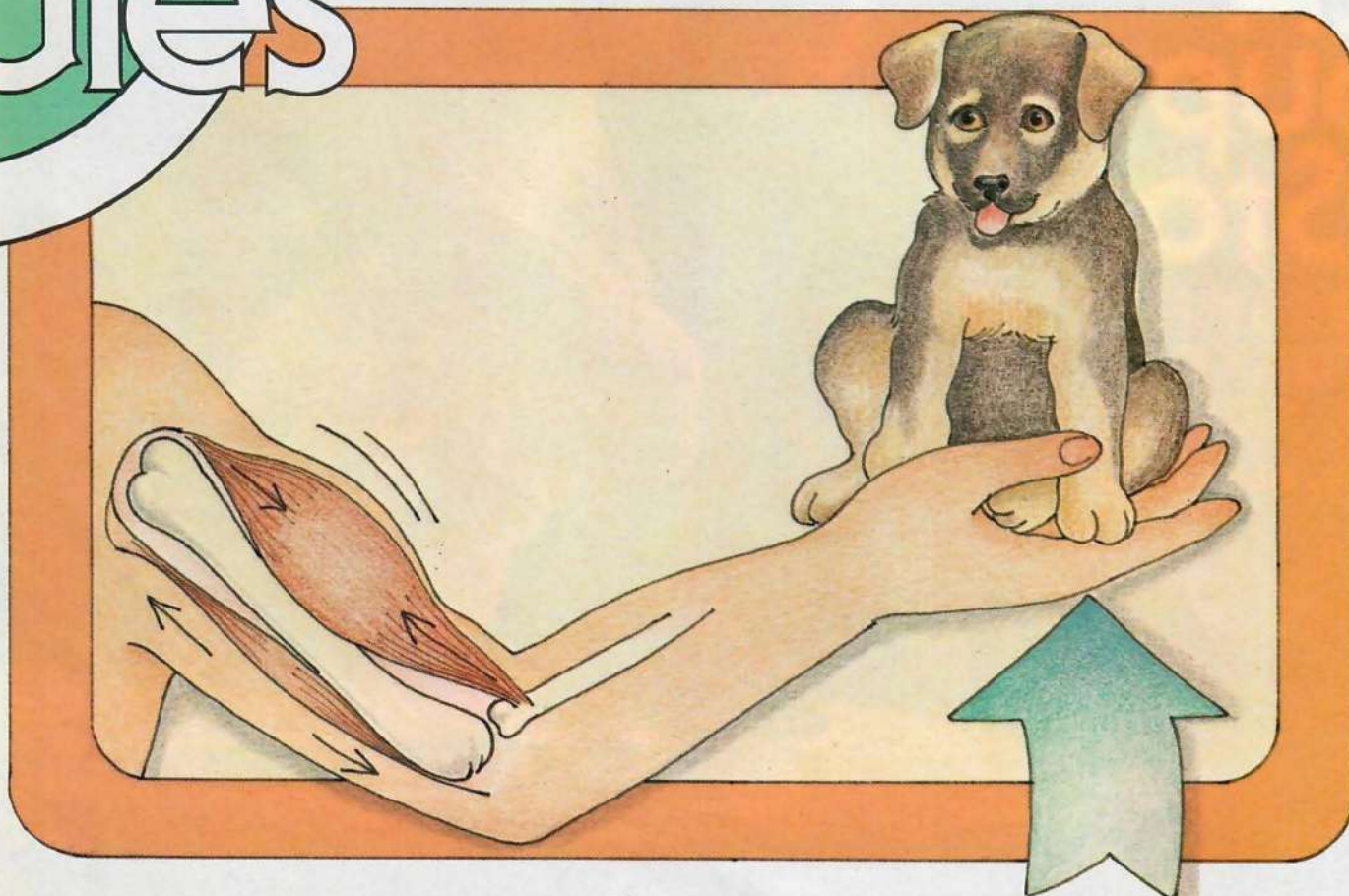
**Heart Muscle** This has got to be your most important muscle of all. Your heart is a combination of both skeletal muscle and smooth muscle. The heart is so strong that it beats constantly from before you're born to the day you die. For the average person, that would be about two and a half *billion* beats in a lifetime!

## How Your Muscles Work

Your muscles work the way a spring does. Each muscle is made up of cells. When the muscle cells squeeze together or *contract*, the muscle gets smaller. The part of the body attached to the muscle moves.

Your skeletal muscles usually work in pairs. Touch your nose with your finger. To do this you must bend your arm. When you do, the biceps (BY-seps) muscle in your arm contracts. When you straighten your arm out, this muscle relaxes. Another one on the other side of your arm, called the triceps (TRY-seps), contracts. Your skeletal muscles are the quickest workers. It takes a fraction of a second for them to spring into action. 

dies



ILLUSTRATIONS © SUSAN GRAY



Now that spring is here, kids and adults are shaping up for the sunny days that are ahead. To help you shape up, CONTACT asked Peggy Fleming, Olympic figure skating champ and a reporter for ABC-TV, about exercise tips for kids.

First and most important, Peggy Fleming says you've got to warm up your body. "Take about five or 10 minutes to stretch your muscles. Do deep knee bends, stretch your arms above your head, bend from side to side. But not so fast! Muscles need to stretch out *slowly* and easily. And take deep breaths to get the most oxygen to your brain and muscles. It'll make you more alert and give you an 'all systems go' feeling."

Peggy Fleming adds that when you're warming up for sports in cool weather, wear layers of clothes, such as leotards, leg warmers and sweatpants. As your muscles begin to warm up,

you can peel off the outer layers.

"Just as important as warming up is cooling down after you work out," the skater says. "If you ran, then walk a little. Let your breathing and heart rate return to normal. Do more stretching. In your cooldown time keep the muscles from tightening up again."

As for sports technique, Peggy Fleming suggests, "Learn the basics before you take the next step. They may seem boring, but you have to perfect them before you move on."

The skating champion says that beginner athletes should choose a sport because they enjoy it. "And when you start out," she says, "don't set your goals so high. If, over time, it develops into something serious, then you can begin to set goals. Everybody has a talent for something. Finding it is the hardest thing." **Q21**

# Tips From A Super- Star

## PEGGY FLEMING'S WORKOUT ADVICE

by Marc Derman

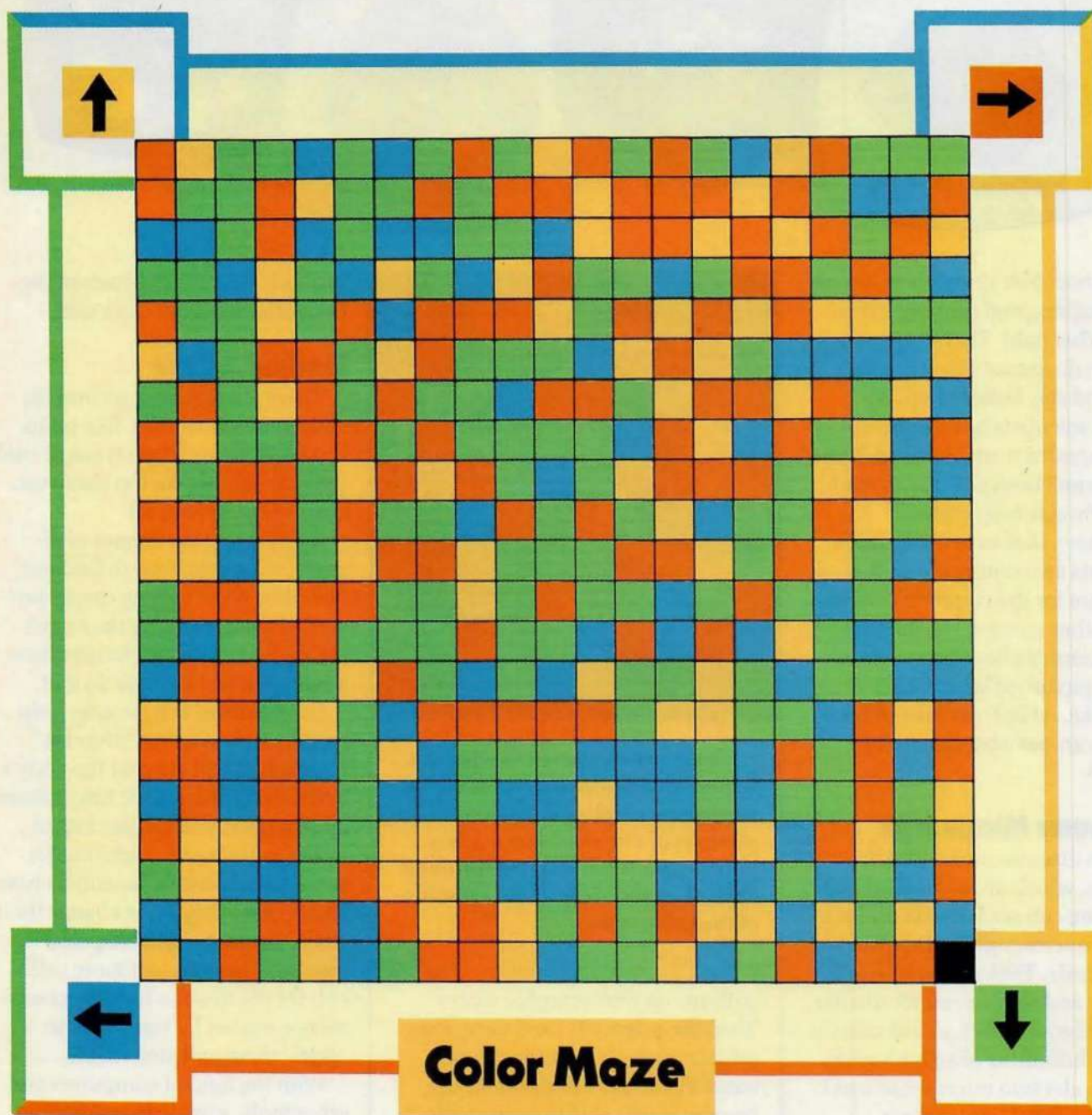


PHOTO BY JERRY WACHTER/FOCUS ON SPORTS



# enter

THE  
HIGH-TECH  
WORLD OF  
COMPUTERS



To solve this maze you must travel from the top row of boxes to the black box in the lower right-hand corner. You can start in any box in the top row. But you can only move in one

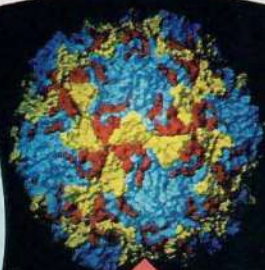
direction, depending on the color of the box you're in. Green means move down one box, yellow means move up one box, blue means left and red means right. **Answer on the Did It! page.**



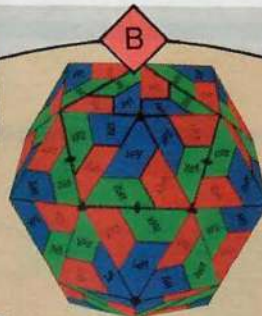
# newsbeat

## A Clear Look at a Cold

by David Powell



A



B



C

Ah-choo! You're sniffing, sneezing, coughing and running a fever. It's another cold. There's not much you can do except drink chicken soup and stay bundled up. Although scientists have come up with cures for many diseases, they still haven't been able to do much about the common cold.

But now, thanks to computers, scientists are coming closer to finding a cure for the common cold and many other viruses. For the first time, scientists have been able to draw a picture of what a cold virus looks like. At last, doctors and scientists can see what they're up against!

### Computer Microscope

Some diseases are caused by bacteria, which are one-celled animals. You can see bacteria under a regular microscope. But viruses are not animals. They are bundles of protein, and they are much smaller than bacteria. In fact, a cold virus is only 30 billionths of an inch wide. Even an electron microscope can't give you a good look at them.

So to make the pictures of the cold viruses, scientists and researchers at Purdue University in Indiana bombarded the viruses with X-rays. The X-rays formed

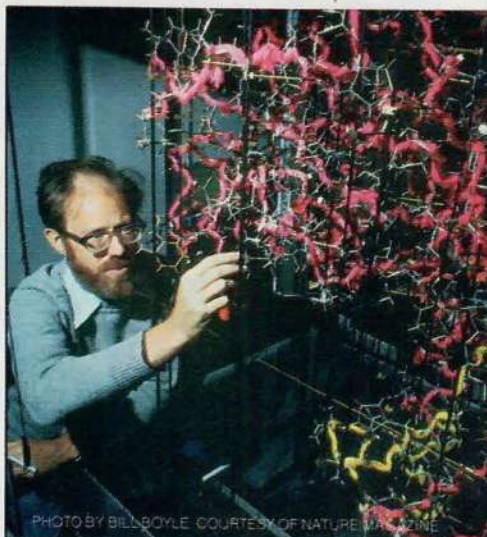


PHOTO BY BILL BOYLE. COURTESY OF NATURE MAGAZINE.

The scientist above is building a model of a cold virus. At the top of the page are some computer-drawn pictures of viruses. Figure A is a polio virus. B is a chart of the outer shell of a cold virus. C is a close-up of the polio virus.

patterns on photographic plates. Then the scientists used very powerful computers to study the patterns. From this information, the computer was able to create a picture of a virus.

Other researchers at the Scripps Clinic in California used the same method to create a picture of the polio virus. Now scientists are us-

ing both pictures to compare the two different types of viruses.

### Finding A Cure

There are already vaccines for some types of viruses, like polio. But there are over 100 types of cold virus. It would take too many vaccines to fight them all.

By studying the shapes of viruses, scientists hope to find out how they work so they can be prevented from invading the body's cells. The computer pictures have already helped them to do that.

For example, the pictures help explain how viruses "disguise" themselves and get past the body's defenses. If you look at the pictures on this page, you can see lots of peaks, valleys and ridges on the surface of the virus. Scientists have found that viruses can change their shapes by moving those peaks around. This makes it more difficult for the disease-fighting chemicals produced by your body to "grab" them and stop them.

With the help of computers and other tools, scientists are moving closer to a cure every day. Now at least they can see what they're fighting. And if they keep it up, someday it will be called the uncommon cold.

(A) AND (C) COURTESY OF SCRIPPS CLINIC AND RESEARCH FOUNDATION. (B) BY BILL BOYLE, COURTESY OF NATURE MAGAZINE.



# The Slipped Disk Show



ILLUSTRATION BY CAMERON EAGLE

Hello, children. Yes, it's time for the Slipped Disk Show, but Slipped isn't here. Every month that wise-guy son of mine tries to act like a big-shot computer expert. Every month he mouths off in this fancy-shmancy magazine, like a regular know-it-all. But does he ever once give me any credit? His own mother, who taught him everything he knows? Not on your life!

Well, May 11 is Mother's Day, so this month your questions are being answered by me, Mrs. Rita Disk, Slipped Disk's mom.

Now, our first question comes from **Bradley McAllister** of Warner Robins, Georgia. Bradley has very nice handwriting, and he asks:

**"What is a modem?"**

Bradley, I'd be glad to answer the question of such an intelligent, polite boy. A modem is a piece of equipment that connects your computer to a telephone line. The modem takes information from your computer and turns it into signals that can be carried on a phone line. It also receives signals and changes them so they can be stored in, or displayed on, your computer. With a modem, you can send and receive messages from other computers anywhere in the world.

Now, Bradley, wasn't that

interesting? Thanks for writing and keep up the good penmanship.

Our next question comes from **Craig VanderZwaag**, of Woodland, California. Craig wants to know:

**"What is a bulletin board system (BBS)?"**

Craig, if you go down to your local laundromat, right next to the pay phone is a piece of cork and on it is a notice from someone trying to get rid of a 1972 Thunderbird. That's a bulletin board.

Now, a bulletin board system (BBS) is something else. A BBS is a computer that has been programmed to accept and store messages over the phone. If you own a computer and a modem, you can dial the BBS's phone number, and all the messages will appear on your screen. Then you can leave your own message.

Some bulletin board systems are free—anyone can dial in. Some charge a fee, and ask for a special password before you can get access.

By the way, I have a bulletin board system on my computer, but does my son Slipped ever leave a message on it? Noooo! He's too busy with his stupid show.

Speaking of which, here's our last question, from **Connie Brooks**, of Forestville, California:

**"What is the difference between a floppy disk and a hard disk?"**

Connie, you sound like a nice girl. Too bad my son Slipped never meets nice, intelligent girls like you. I bet you never forget to leave messages on your mother's BBS.

To answer your question, both kinds of disks are used to store computer information. A floppy disk is inserted in a disk drive, which reads information from it into the computer and also writes (or stores) data on it. Floppies hold a limited amount of information (about 400K per side).

A hard disk can hold much more information—as much as 20,000 K. But they are much more delicate, so that they are kept in sealed boxes. They work faster than floppies, but they are more expensive.

Well, children, that's it for this month's show. Slipped will be back next month (if he's a good boy). If you'd like, you can write to him at:  
**The Slipped Disk Show**  
**3-2-1 CONTACT Magazine**  
**1 Lincoln Plaza**  
**New York, N.Y. 10023**

And don't forget to wish your mother Happy Mother's Day!

**Slipped Disk takes after his father's side of the family.**



# REVIEWS

by Phil Wiswell and Bill Gillette



## Superman

(First Star Software, \$29.95, Commodore 64/128; also for Apple II and Atari)

This one or two player action game allows you to play against your friends or the computer. You can take the part of either Superman or the evil Darkseid. But actually, this is just a highly developed version of the old game "Pong."

The idea is for Superman to gain points by rescuing stranded humans from the game's three levels. He must return them to safety, while avoiding the beams of Darkseid. Superman also has beams. When you strike your opponent with one, you don't harm him, you just win points.

Each screen contains mirrors which can be turned by either player. The beams bounce off the mirrors, and go off in crazy patterns. It takes quite a bit of patience to get the hang of this game, but we found it worth the effort.

### Wrap-Up

**Bill:** Superman is one of the few true "head-to-head" action games around. It certainly kept Phil and

me busy squirming in our chairs.

**Phil:** Yes, I like it, but it doesn't have any more to do with Superman than any other game.

## Chem Lab

(Simon & Schuster, \$40, Apple II)

We always thought chemistry was a subject you had to experience first hand to understand. But here is a chemistry set that isn't expensive, messy or dangerous. Yet it allows you to perform 50 different experiments using thousands of different chemical reactions—all from the keyboard of your computer.

Each of the 50 experiments revolves around a simple story. For example, you might be the president of a soft drink company whose drink needs more fizz. Your available raw materials are magnesium, carbon, water, hydrochloric acid, hydrogen and oxygen. Your task is to create carbon dioxide. Think you could whip up a batch? If you're not careful, the chemicals might explode all over your screen!

### Wrap-Up

**Bill:** Chem Lab is a lot easier and safer than mixing chemicals by hand. It also gives you the opportunity to work with chemicals you would never get in a home chemistry set.

**Phil:** I had a chemistry set when I was younger, but there were such small amounts of chemicals that I couldn't do much experimenting. Chem Lab solves that problem and it looks good, too.

## Borrowed Time

(Activision, \$35, Commodore 64)

*Borrowed Time* is a graphics/text mystery/adventure set in the 1930's. You play the part of a private detective, with an unusual twist—you're not looking for somebody, somebody's looking for you! It seems that a suspect from one of your previous cases holds a grudge, and you have one day to figure out who it is.

Some clues are in the text; others are in the graphics. Sometimes the text will describe an object, but just as often, you'll see it in the picture on your screen. The graphics load very quickly.

You use both a joystick and the keyboard, and there are helpful playing guides right on the screen.

### Wrap-Up

**Phil:** I had a lot of fun with this adventure. I think I've got a lot more to go, although I might be closing in on the guilty party faster than I think. The unusual twist of being chased keeps up the suspense.

**Bill:** I like using the joystick and the keyboard. That saves you a lot of time—which is something you don't have much of in this game!







## The Other Side

(Tom Snyder Productions, \$69.95, Apple II)

This very unusual computer game works best with two computers. You can play with just one, but you need two teams of players and it's much more enjoyable if each team has its own computer. A modem can be used to play the game, so the teams can be at different locations.

The two teams represent different countries, known as "one side" and, of course, "the other side." The object of the game is to build a bridge, one section at a time, from your side of the world to their side. You can build the bridge either by competing with the other side or cooperating with them. To win you have to be good at settling arguments. Neither side can win by beating the other team. On the other hand, you can't trust your opponent completely.

The computer keeps track of your moves as you try to develop resources around the "world." When an argument between the two sides develops, you must work to settle it peacefully. Otherwise, the bridge may collapse and both sides lose.

### Wrap-Up

**Phil:** Beware, this is not an easy game, and you can't play it alone. It's a wonderful program for class-

rooms, because it teaches about politics and getting along with others in a fun way.

**Bill:** Two teams playing games with a modem is a great idea. It's really best with two teams of any size—the more the merrier.

## The Hobbit

(Addison-Wesley, \$34.95, Apple II; also for IBM and Commodore 64)

This graphics/text adventure is set in the land of "Middle Earth." It is based on, and comes packaged with, the famous fantasy novel of the same name. The book will hardly help you to solve the game. But the game will probably make you want to read the book.

You play the part of Bilbo, a creature of the Hobbit race. You are suddenly caught up in a scary, magical trip with Gandalf the magician as your guide. Along with Thorin the dwarf, you travel through strange lands and meet even stranger creatures—trolls, goblins, elves and more. If you're lucky or clever, they will help you find your way.



### Wrap-Up

**Bill:** *The Hobbit* is not as easy as it looks. It requires your brain to be in high gear.

**Phil:** I don't really like this game. The book is so much better, that the game just doesn't stand up by comparison.



## A.P.B.A. Major League Players Baseball

(Random House, \$89.95, IBM PC)

This computerized baseball game is not like most that you can buy. It's a manager's game, a game of strategy, not an arcade-type game. You don't adjust your swing by pressing a button or throw the ball around the field using a joystick.

The focus of this game is to make the kind of decisions a manager makes during a real baseball game. You pick the line up, decide when to send in a pinch hitter and when to call the bullpen for a relief pitcher. And, you play with "real" players. The game comes with a statistics disk. We had a 1984 disk, but the 1985 disk should be out by the time you read this.

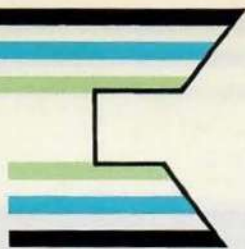
This game has the flavor of baseball. The scoreboard announces each play. Playing is simple. You pitch the ball, and your opponent decides whether or not to bat. The computer decides the results based on statistics.

### Wrap-Up

**Bill:** The program has nothing to do with reflexes or hand-eye coordination. It's all strategy. This game is for a baseball nut!

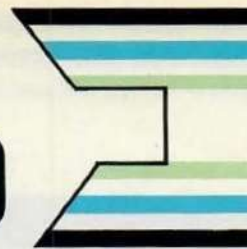
**Phil:** I'm not a baseball fan, so I didn't enjoy the game very much.





# BASIC TRAINING

PROGRAMS FOR YOUR COMPUTER



## Mind Reader

Apple, Atari, Commodore, IBM, TI  
99/4A

Some people think computers are very smart. Well here's a program that will "prove" it. With it, you can make it look like your computer can read minds.

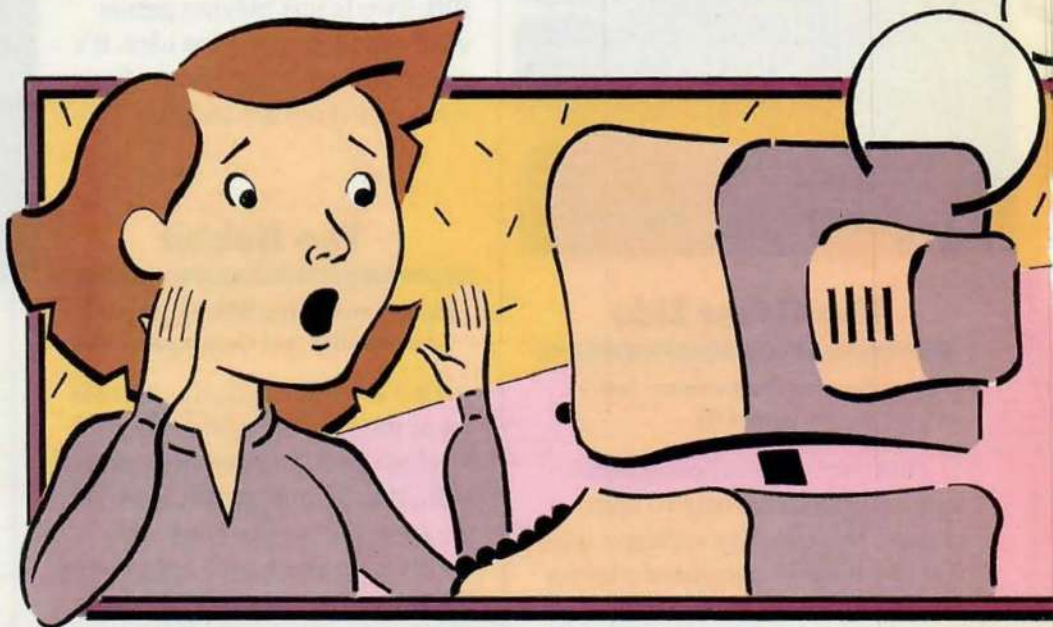
Type in the program and then ask a friend to step up to your computer. Tell your friend that your computer can read your mind, and "see" whoever is standing in front of it. Then you tell your friend that you are typing some questions into the computer. You wait a few seconds while the computer "reads your mind" and magically, the right answer appears on the screen!

How does it work? The program makes it look like you are typing in the questions, but you are really typing in the answers! The questions are already in the program in the DATA statements. You type in the answer, but the question appears on the screen.

Make sure you memorize the questions before starting. When you've finished typing in the answer, you must hit return. Then pretend that you're typing in the rest of the question.

You can change the questions by changing the DATA statements. Or you can add more by adding new DATA statements, but you must also change the number in line 50 (in the Apple version—different in other versions).

"Mind Reader" was adapted with permission from a program by David D. Busch that appeared in 80 Microcomputing Magazine.



### Apple

```
10 DIM A$(50),B$(50),C$(50)
20 HOME
30 PRINT "I KNOW ALL, SEE ALL"
40 PRINT "APPROACH AND BE
  ENLIGHTENED"
50 FOR Y = 1 TO 5
60 READ A$
70 FOR X = 1 TO LEN (A$)
80 GET B$
90 IF B$ = CHR$(13) THEN A = 1
100 IF A <> 1 THEN C$ = C$ + B$
110 PRINT MID$(A$,X,1);
120 NEXT X
130 PRINT
140 FOR X = 1 TO 50
150 PRINT "I AM READING YOUR
  MIND WAVES"
160 NEXT X
170 HOME
180 PRINT "THE ANSWER IS ----"
190 PRINT C$
200 A = 0:B$ = "":C$ = "":NEXT Y
210 PRINT "I AM TIRED NOW, GO
  AWAY"
220 DATA CAN YOU SEE THIS
  PERSON?
230 DATA WHAT IS HIS/HER
  NAME?
240 DATA WHAT COLOR SHOES?
250 DATA WHAT COLOR HAIR?
260 DATA WHAT SCHOOL?
```

### Atari

```
10 OPEN #1,4,0,"K:"
20 DIM A$(80),B$(80)
30 GRAPHICS 0
40 PRINT "I KNOW ALL, SEE ALL"
50 PRINT "APPROACH AND BE
  ENLIGHTENED"
60 FOR Y = 1 TO 5
70 READ A$
80 FOR X = 1 TO LEN(A$)
90 GET #1,K:PRINT A$(X,X);
100 IF K = 155 THEN A = 1
110 IF A <> 1 THEN
  B$(X,X) = CHR$(K)
120 NEXT X
130 PRINT
140 FOR X = 1 TO 40
150 PRINT "I AM READING YOUR
  MIND WAVES"
160 NEXT X
170 PRINT CHR$(125)
180 PRINT "THE ANSWER IS ----"
190 PRINT B$
200 A = 0:B$ = "":NEXT Y
210 PRINT "I AM TIRED NOW, GO
  AWAY"
220 DATA CAN YOU SEE THIS
  PERSON?
230 DATA WHAT IS HIS/HER NAME?
240 DATA WHAT COLOR SHOES?
250 DATA COLOR HAIR?
260 DATA WHAT SCHOOL?
```





### Commodore 64

```

10 DIM A$(50),B$(50),C$(50)
20 PRINT CHR$(147)
30 PRINT "I KNOW ALL, SEE ALL"
40 PRINT "APPROACH AND BE
   ENLIGHTENED"
50 FOR Y=1 TO 5
60 READ A$
70 FOR X=1 TO LEN(A$)
80 GET B$: IF B$="" THEN 80
90 IF B$=CHR$(13) THEN A=1
100 IF A < > 1 THEN C$=C$+B$
110 PRINT MID$(A$,X,1);
120 NEXT X
130 PRINT
140 FOR X=1 TO 50
150 PRINT "I AM READING YOUR
   MIND WAVES"
160 NEXT X
170 PRINT CHR$(147)
180 PRINT "THE ANSWER IS ---"
190 PRINT C$
200 A=0:B$=""C$="":NEXT Y
210 PRINT "I AM TIRED NOW, GO
   AWAY"
220 DATA CAN YOU SEE THIS
   PERSON?
230 DATA WHAT IS HIS/HER
   NAME?
240 DATA WHAT COLOR SHOES?
250 DATA WHAT COLOR HAIR?
260 DATA WHAT SCHOOL?

```

### IBM

```

10 DIM A$(50),B$(50),C$(50)
20 CLS
30 PRINT "I KNOW ALL, SEE ALL"
40 PRINT "APPROACH AND BE
   ENLIGHTENED"
50 FOR Y=1 TO 5
60 READ A$
70 FOR X=1 TO LEN(A$)
80 B$=INKEY$
90 IF B$="" THEN 80
100 IF B$=CHR$(13) THEN A=1
110 IF A < > 1 THEN C$=C$+B$
120 PRINT MID$(A$,X,1);
130 NEXT X
140 PRINT
150 FOR X=1 TO 50
160 PRINT "I AM READING YOUR
   MIND WAVES"
170 NEXT X
180 CLS
190 PRINT "THE ANSWER IS---"
200 PRINT C$
210 A=0:B$=""C$="":NEXT Y
220 PRINT "I AM TIRED NOW, GO
   AWAY"
230 DATA CAN YOU SEE THIS
   PERSON?
240 DATA WHAT IS HIS/HER
   NAME?
250 DATA WHAT COLOR SHOES?
260 DATA WHAT COLOR HAIR?
270 DATA WHAT SCHOOL?

```

```

180 NEXT X
190 CALL CLEAR
200 PRINT "THE ANSWER IS---"
210 PRINT C$
220 A=0
230 C$=""
240 NEXT Y
250 PRINT "I AM TIRED NOW, GO
   AWAY"
260 DATA CAN YOU SEE THIS
   PERSON?
270 DATA WHAT IS HIS/HER
   NAME?
280 DATA WHAT COLOR SHOES?
290 DATA WHAT COLOR HAIR?
300 DATA WHAT SCHOOL?

```

### Send Us Your Programs

Have you written a program you think should be in BASIC Training? If you have, then send it to us at:

**BASIC TRAINING**

**3-2-1 CONTACT**

**1 Lincoln Plaza**

**New York, NY 10023.**

If we like it, we'll print it, and send you \$25 and a T-shirt.

All programs must be your original work. Remember to include a note with your program that tells us your name, age, and T-shirt size. Don't forget to tell us the brand of computer you used and to include a short description of what the program does.

### TI 99/4A

```

10 CALL CLEAR
20 PRINT "I KNOW ALL, SEE ALL"
30 PRINT "APPROACH AND BE
   ENLIGHTENED"
40 FOR Y=1 TO 5
50 READ A$
60 FOR X=1 TO LEN(A$)
70 CALL KEY (0,K,S)
80 IF S=0 THEN 70
90 IF K < > 13 THEN 110
100 A=1
110 IF A=1 THEN 130
120 C$=C$&CHR$(K)
130 PRINT SEG$(A$,X,1)
140 NEXT X
150 PRINT
160 FOR X=1 TO 50
170 PRINT "I AM READING YOUR
   MIND WAVES"

```

### Correction

The program titled "Star Chat" in our Jan/Feb 1986 issue contained a mistake. Line 60 of the Apple version should have read:

```

60 DATA 173, 48, 192, 136, 208, 5,
   206, 1, 3, 240, 9, 202, 208, 245,
   174, 0, 3, 76, 2, 3, 96

```



# Extra!

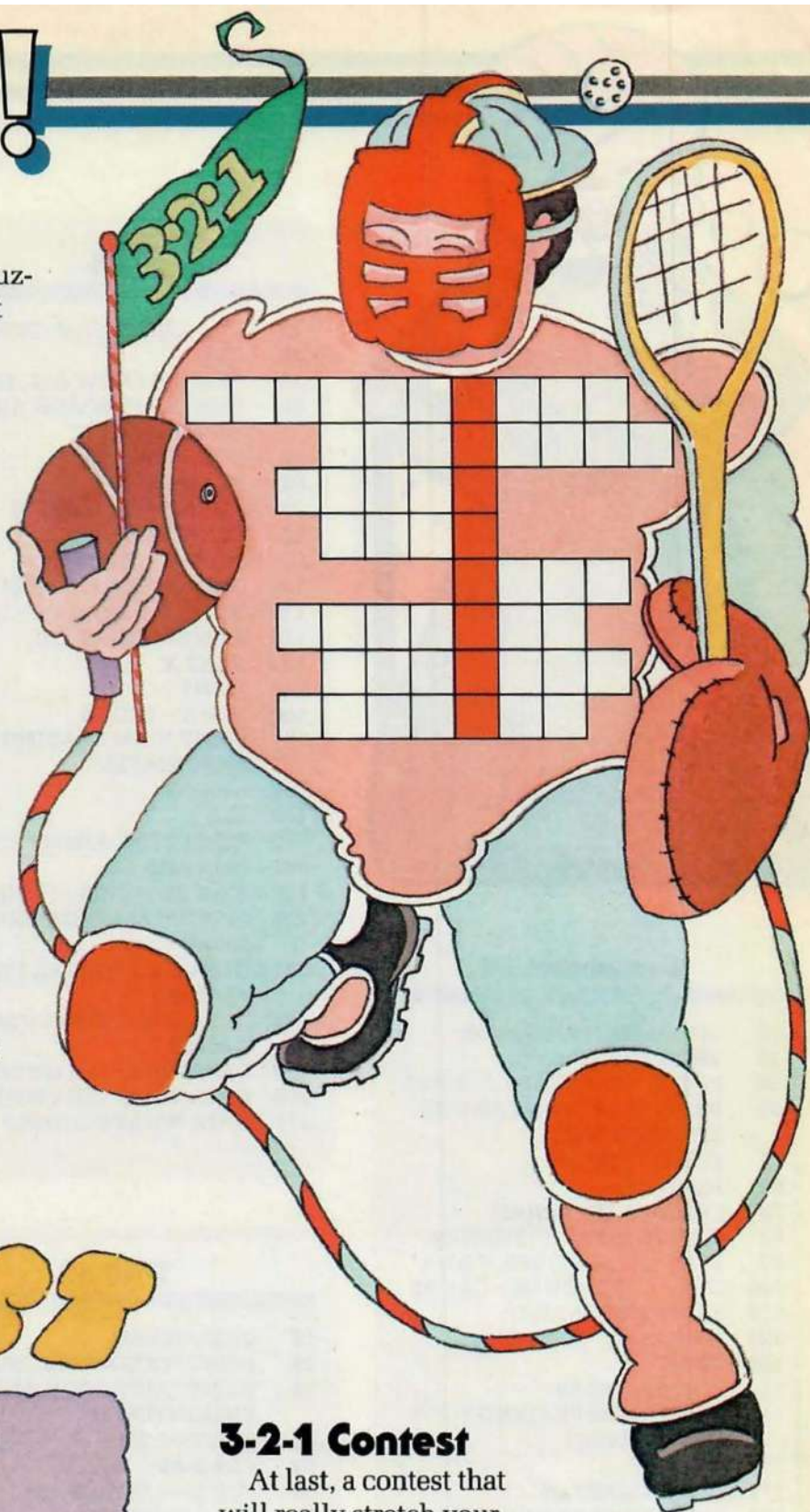
by Ellen R. Mednick

You're not done yet! We've got lots of puzzles and games to keep you jumping, right here in EXTRA!

## Mind Games

Try this brain game that will test your sports know-how. Find the words going across by answering the eight questions below. The letters shaded in red will spell out the name of a timely sport. Then turn to the Did It! page for the answer.

1. The Boston Celtics are a \_\_\_\_\_ team.
2. You wear these on your feet for most sports.
3. Double Dutchers use jump \_\_\_\_\_.
4. Where all baseball players want to go.
5. A person builds up his or her \_\_\_\_\_ to get in shape.
6. Mary Lou Retton is a famous \_\_\_\_\_.
7. A person who plays sports is called an \_\_\_\_\_.
8. You need strong \_\_\_\_\_ for sports.



## CONTEST



### 3-2-1 Contest

At last, a contest that will really stretch your imagination. First, make up the name of a sports team (it can be any sport—from bowling to baseball, track to hula-hooping). Then design the uniform and emblem for your imaginary squad. It can be silly, funny or serious. Don't forget to tell us the city where your team plays. We'll choose our favorites. The 20 best will receive a book from the Avon Superstar Series.

Send entries to: **CONTACT Sports Contest**  
P.O. Box 599  
Ridgefield, NJ 07657



## Math-A-Magic

Here's a magic trick that will amaze your friends and thrill your family. No matter what three digit number you choose, your answer will always be 1089. All you need is some clever adding and subtracting—plus, of course, a pencil and paper.

1. Choose a three-digit number. Each of the digits must be different.
2. Write it down.
3. Reverse that number and *subtract* it from your original number. If your answer is a 2-digit number place a zero as the first digit (99 would be 099).
4. Write down your answer.
5. Reverse it and *add* those two numbers together.
6. Your answer will always be 1089.

We've done one for you.

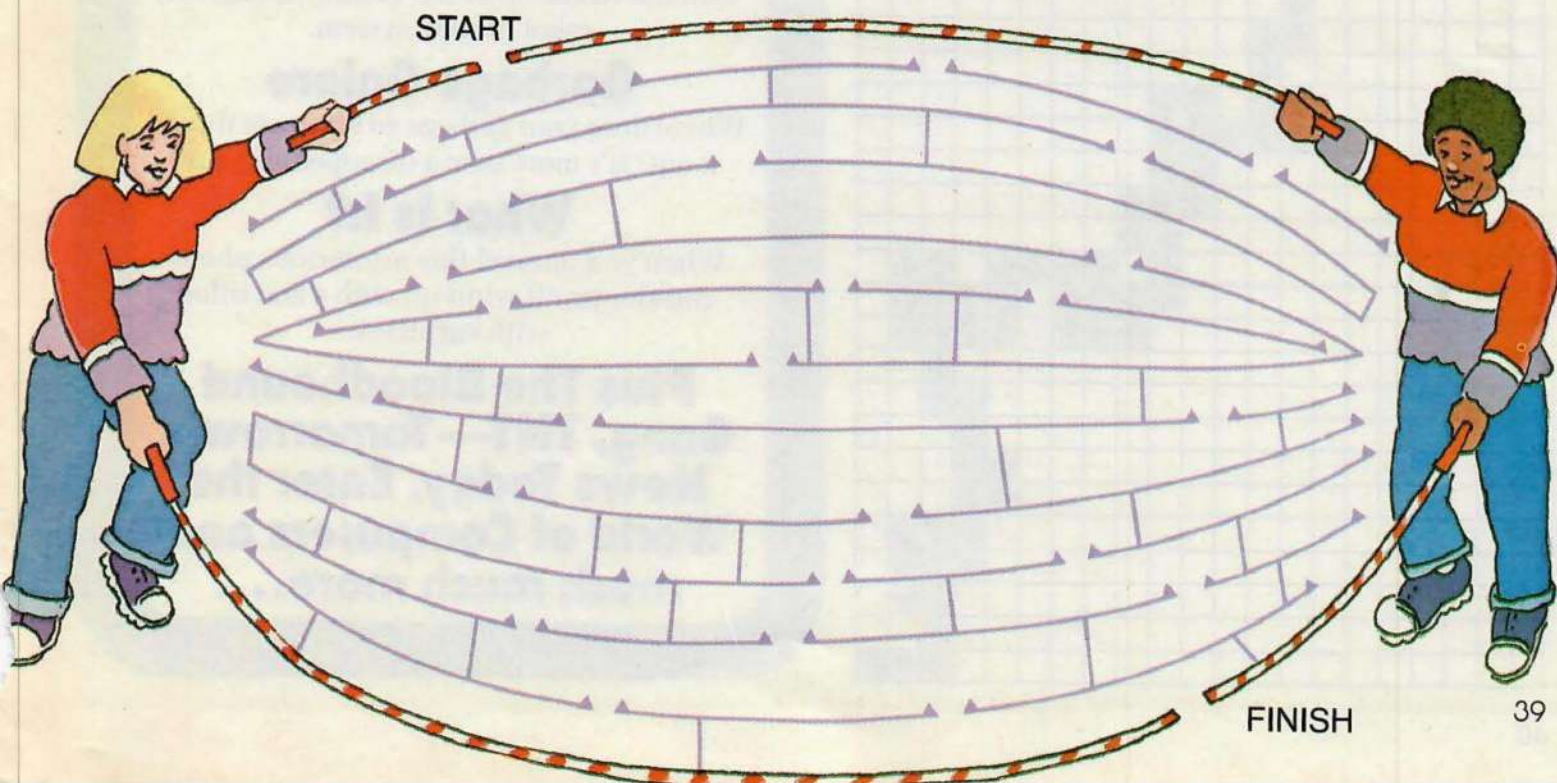
$$\begin{array}{r} 742 \\ - 247 \\ \hline 495 \end{array} \qquad \begin{array}{r} 495 \\ + 594 \\ \hline 1089 \end{array}$$



ILLUSTRATIONS BY MICHAEL DONATO

## Double Trouble

You've read about some of the best double dutchers in the land. Now try jumping your way out of this amazing maze. Can you get from start to finish without a miss? See the Did It! page for the answer.



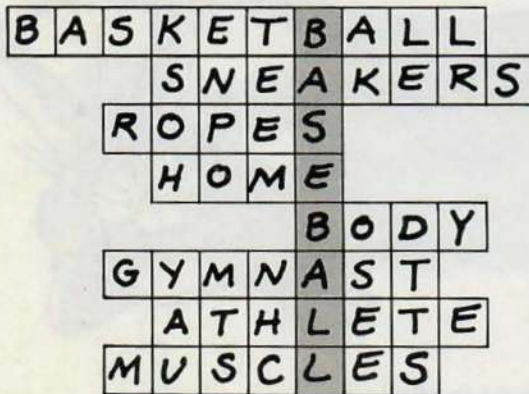


# Did It!

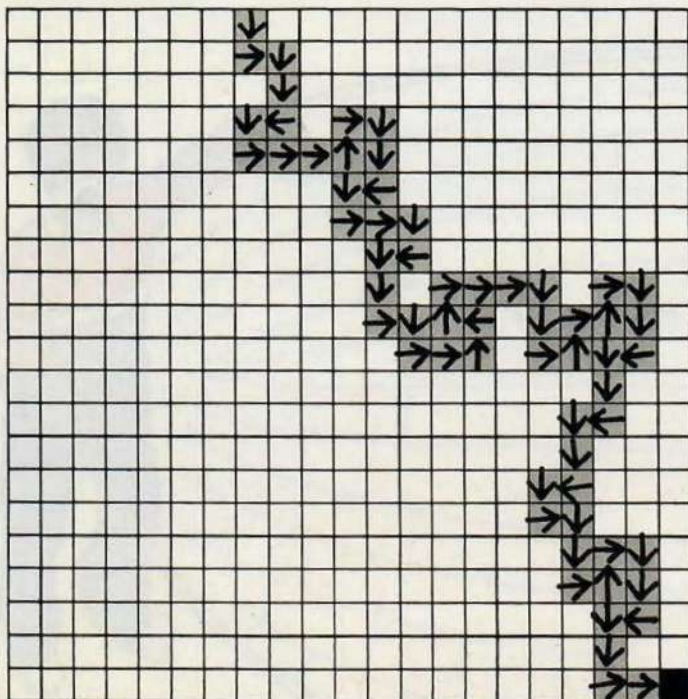
## Thank You!

Thanks to our student intern Debra Glicksman for all her work on this issue.

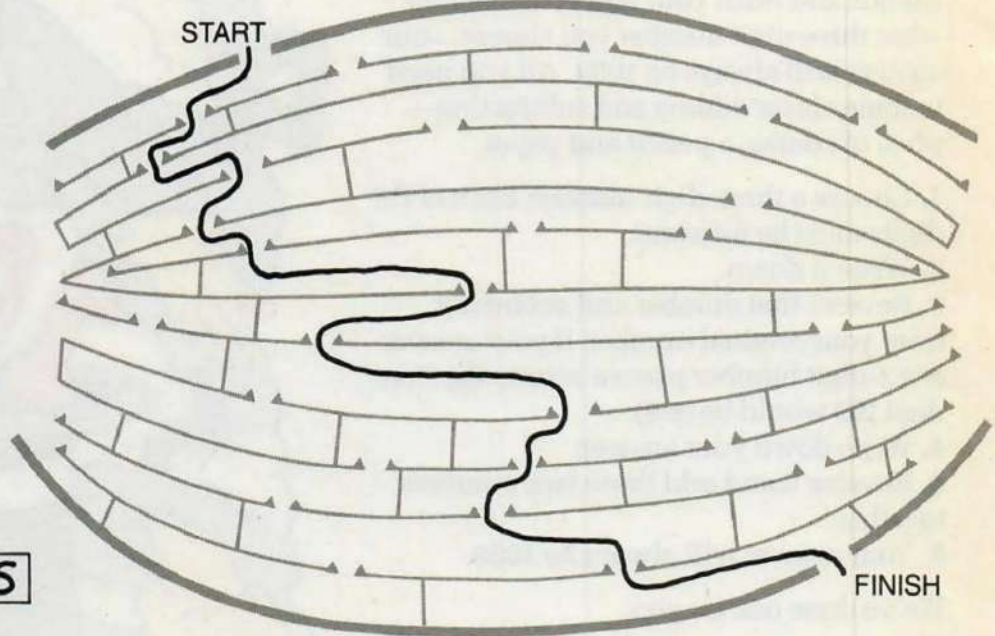
## Mind Games



## Color Maze



## Double Trouble



## Next Month!

Here's a quick peek at what you'll find next month in 3-2-1 CONTACT:

### The Search for the Titanic

Visit the wreckage of the Titanic thanks to a robot camera system.

### Garbage Galore

Where does your garbage go after you throw it out? It's more than a disappearing act!

### What Is It?

When you unravel this mysterious photo puzzle, you'll wind up with a zoo filled with surprises.

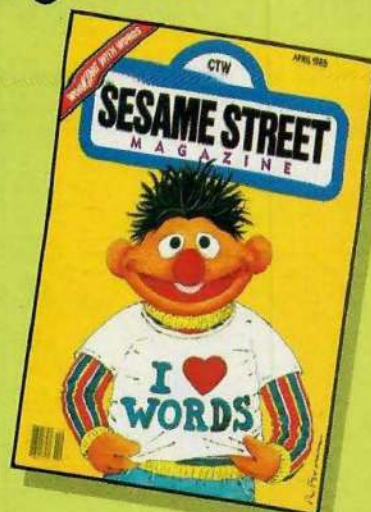
**Plus The Bloodhound Gang, TNT—Tomorrow's News Today, Enter the World of Computers and much much more....**



# LEARNING IS FUN ...

## Sesame Street Magazine

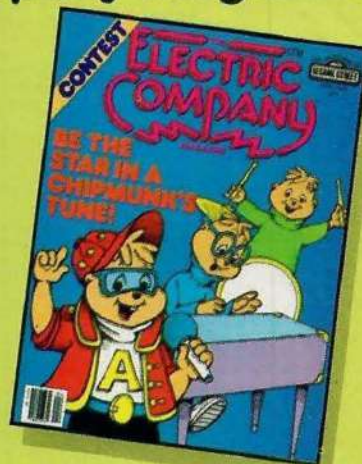
**B**ig Bird and his delightful friends bring dozens of playful surprises, ten terrific times a year. (It's the entertaining education that Sesame Street does best!) Puzzles, cut-outs, games, A-B-C's, 1-2-3's...there's all the magic of the TV super-series in every colorful issue.



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## 3-2-1 Contact

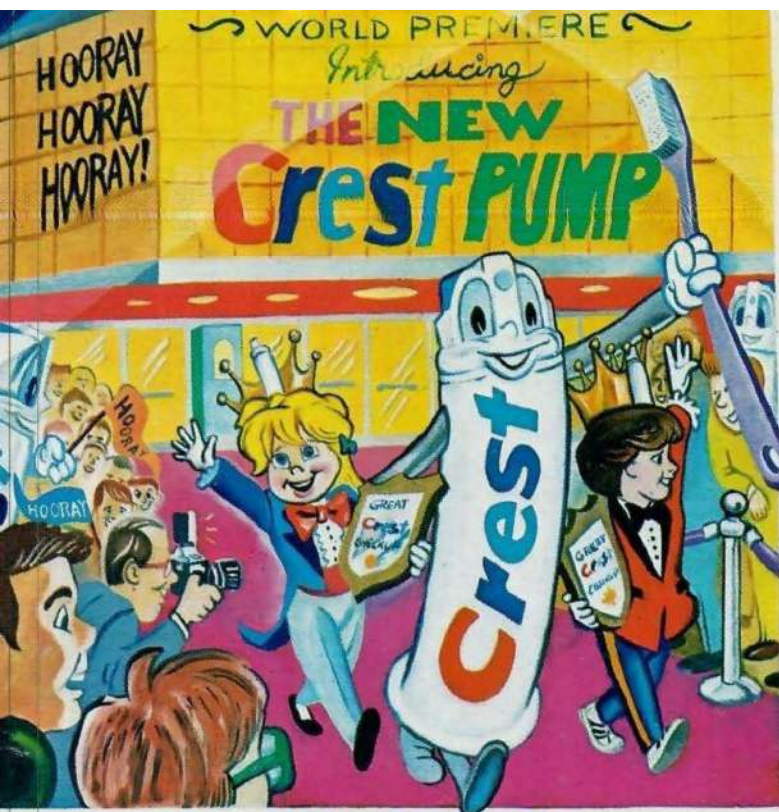
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Children's Television Workshop  
One Lincoln Plaza  
New York, NY 10023





**HOORAY! HOORAY!  
THERE'S A NEAT NEW WAY...**



**TO GET A GREAT CREST CHECKUP.  
NEW CREST PUMP-HOORAY!**

